"SEA LAND and AIR"

THE AUSTRALIAN NATIONAL MONTHLY

— OF —

TOPICAL INTEREST

Edited by M. DIXON.

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The Editor will be pleased to receive, for consideration, contributions on Aviation, Wireless, the Navy, Mercantile Marine or other subjects within the scope of *Sea, Land and Air*. All MSS., photographs, drawings, etc., submitted must bear the sender's name on back and be accompanied by postage stamps for return if unsuitable. Although every care will be taken of all contributions received, no responsibility is accepted.

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SEA LAND AND AIR

AUSTRALIA'S NATIONAL MONTHLY

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Month by Month

To our many Readers and Business Friends we extend our sincerest wishes for a Bright, Happy and Prosperous New Year.

The Old Year and the New.

"The King is dead—long live the King."

Somebody made the quotation reverently as old, grey - haired December drew a last agonizing breath and expired. and the glory of the New Year, like the birth of a new soul, burst full upon us.

The solemnity and grandeur of that wonderful dawn on the famous beach of Waikiki held us enthralled and breathless—it was like a glimpse of Heaven.

The usual rejoicings and songs followed, and the crowd dispersed, most of them happy and contented; but to me there was a vital something lacking, something so poignant that it constituted an ache—an absolute yearning.

Where were the dear old faces that used to gather round in the days gone by—the brothers, sisters, old friends, who gathered together at the homestead each year from all parts of the globe, to eat the same old dinner, sing the same songs, tell the same old stories?

Alas! Many of them I knew had passed down the sunset trail, and others had been lured by the spirit of wanderlust to make their homes under foreign skies and amongst strange peoples. But if there is anything in the "communion of spirits," surely we were all gathered together again this night to celebrate the passing of another milestone on life's journey.

In the midst of my communing I felt unutterably sad to think that many of the customs of bygone years are dying out.

Ten years ago we made desperate struggles to get home for Christmas, wherever we happened to be. Now it is so different.

What good old times those were!

Is it the times that have changed, or is it we?

I wonder!

In these modern days of rush and bustle the happiest home-time of all the year finds our steps turned—not homewards—but off to where the garish pleasures of life bid our fickle hearts hasten. In childhood days we felt that Time was but a myth, and that the world for us would never grow old, nor our hearts hard and careless. Alas! to-day we are face to face with our disillusionment.

Will it always be thus? Will the world and its inhabitants grow colder as they grow older, or can we hope that a reaction may yet come? Again, I wonder!

—*B.L.*

Ready-Made Epithets.

This is an age of "Ready-made." Reach-me-down suits, pre-peptonised milk, shop-cooked chickens, gramaphoned dance music, and their countless analogues, save a tired generation personal effort. In conversation stereotyped epithets avert the mental strain of thinking out appropriate expressions, and we each make some pet phrase serve for all occasions. The writer recently travelled on a service motor. Conversation among the passengers never flagged. A learned lady emphatically agreed with every remark by promptly

replying "absolutely"; a schoolboy's only stock and store was "bonzer"; to a pretty young miss, with golden hair hanging down her back, everything, from a far-spreading panorama to a plump poddy calf, called forth "how perfectly gorgeous"; the pompous gentleman with the white waistcoat sententiously retorted "quite so" whenever anyone ventured to address him; while the present scribe found "precisely" the one word needful. With the multitudinous resources of our wonderful tongue it is strange that most of us fall into narrow mannerisms of speech. To the fierce democracy, indeed, one lurid adjective serves for a whole vocabulary. Yet does not the universal resort to superfluous adverbs and adjectives show that something is necessary to reinforce ordinary phraseology? A simple, unadorned expression seems as flat and flavourless as does pure water which has not been sophisticated by something which effervesces, or even "has a kick." We strive after exaggeration and palpable effect. Those who shrink from the coarser, if more potent epithets, beloved by the distracted multitude fly to less vigorous euphemisms, as "ripping," "rotten" (a most inelegant expression), "immense," "bally," and so on; but all feel, to paraphrase Gilbert, that something more than simple diction is necessary to lend verismilitude to otherwise bald and unconvincing speech phraseology.

—*T.J.H.*

Hydro-Electricity.

At the end of November Sir George Fuller officially opened a hydro-electric plant at Dorrigo, the first of any size to be constructed on the mainland. The scheme at Dorrigo is a simple one. A tiny creek, so insignificant in fact, as to be unworthy of notice in a locality of big streams, has been dammed, and a trickle of water conducted along an open drain for nearly two miles to a waterfall. At the fall the water is confined in a pipe a foot in diameter, and its 200-foot drop generates through the turbines 175 horse-power.

The whole of our coastal belt, particularly along the foothills of the range, is traversed by countless permanent streams, capable of generating millions of horse-power for electrification purposes. Although the Government has promised to take steps to develop these sources of cheap motive power, very little has been done up to date in a practical way. The Dorrigo scheme was carried out by the local shire council and financed by local residents. This in itself is an example that the Government should heed. Economically, there is every reason for the inauguration of a hundred such schemes at the earliest possible moment. In connection with the development of our unoccupied lands, electric railways are destined to play a most important part. In the old days of railway construction the line followed the grade that was easiest to obtain. The consequence of this was that districts and settlements were left unserved, or nearly so, and railways traversed areas where little development could ever take place. An electric railway constructor takes no heed of grades. Hills make little difference to the wizard motive power, and thus the routes can traverse the most fertile regions and serve the richest areas. Construction costs are at a minimum. Power, generated from water, is cheaper than steam, and an electrically driven train will haul thrice the load of the old-type locomotive of equal horse-power. The tremendous possibilities that lie in the prompt and proper development of hydro-electric power must be apparent to our legislators. If so, why do not they get busy?

—*G.B.*

A Dead Leaf.

A few days ago I found this letter and an accompanying envelope with an enclosed letter, that looked as though it had been through the wars, in the treasure trove of a little girl. Behind it lies an interesting history (which the letter explains), and the visible record of the feat of a dead but unforgotten hero, whose first anniversary approaches. The letter is signed thus:

Ross Smith, Capt.

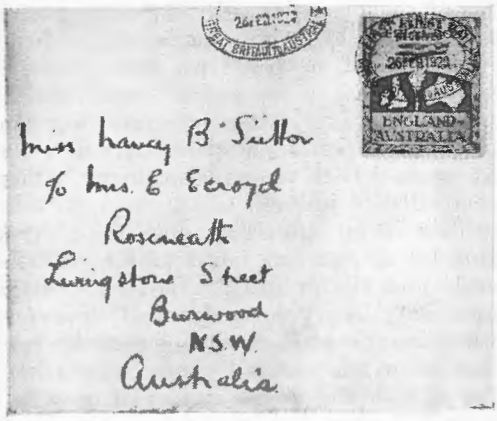
It is dated "London, November, 1919," and it runs:

"The history of this letter may be of some interest. It was given to me in Cairo in November, 1918, to fly to Australia, and I took it to Calcutta a week later in the first "Handley-Page" to fly to India.

"I was then sent off in a ship to explore the route from Calcutta to Australia, and took the letter with me.

"On February 13, 1919, my ship blew up and caught fire. This letter was in an iron box, and, besides going through the fire, was under water for 36 hours. I then rescued it, and took it back to Calcutta.

"Later I took it in another ship to Singapore and the Dutch East Indies, and to within 400



miles of Australia, and then once more returned to India.

"Last October I brought it with me to England, and it is now starting with me for Australia by air in a Vickers-"Vimy." I hope it will be more successful this time.

"I very much regret the delay, and must apologize for its somewhat battered appearance."

The letter is a specially written note from a Sydney woman, who was war-working in Cairo for five years, dated from Mena House to her little girl in Australia. It was written on November 28, 1918, and was delivered by the first aerial mail to Australia, bearing the special air stamp, of which only a very few are extant, on February 26, 1920.

—*M.M.*

The Fire Fiend.

From time to time a credulous public is asked to believe that the bush fires which regularly devastate the country districts of N.S.W., and even the suburbs of Sydney, each year invariably originate either by spontaneous combustion or the mischief-making operations of rats and mice. Occasionally the outbreak is attributed to some unknown cause, but in the end the result is usually the same. Tremendous damage is done; the sufferers receive the sympathy of their friends; and the world at large deplores the fact that fire, which is at once man's best friend and his greatest enemy, should cause such immense damage.

The writer disagrees with those who are content to lay the blame for practically all the fires that occur at the door of the obscure and more or less illusory causes already mentioned. It would be interesting to know just how many cases of fire starting have been *proved* against either spontaneous combustion or the operations of rats and mice. If it were possible to ascertain the number the writer is quite convinced that it would be exceedingly small. It would be much nearer the mark to say that very many of the outbreaks are the work of individuals of evil intent or criminal carelessness. A knowledge of country life and conditions is sufficient to establish this contention beyond reasonable doubt. At the height of a blazing day, when perhaps the wind is blowing in a direction suitable to the designs of some evilly disposed individual a fire mysteriously occurs. To fight it to the best of their ability is part of the day's work of the average settler, but it is cruel, heartbreaking work, and oftentimes the attempt to beat it out proves in vain. To check its spread to the homestead is then the only hope, and sometimes that, too, fails. The result then can be more easily imagined than described.

There is urgent need that the closest investigation should be made as to the origin of the fires which occur from time to time. If the results prove that the causes were beyond human control it at least affords general satisfaction to all concerned to know it. If, on the other hand, the blame can be sheeted home to some criminal or careless individuals, they should be made to pay dearly for their misdeeds.

—*M.D.*

Deaf and Dumb Bazaar.

The then Lady Mayoress of Sydney (Mrs. McElhone), in opening a bazaar in aid of the building fund of the Deaf and Dumb Institute last month, spoke feelingly and sympathetically of the good work that stood to the credit of the Institute.

"She was amazed to find," she said, when the matter was brought under her notice, "how little thought she had pre-

viously given to it. Most people were probably in the same position; their apparent thoughtlessness and apathy was due to the fact that they had never given the subject any really serious thought.

Now that it was brought before the public notice she was sure that everybody would respond whole-heartedly and sympathetically.

While the Lady Mayoress was speaking a deaf and dumb interpreter translated the speech with quick movements of the fingers, wrist and arm, so that at the conclusion of the speech she was greeted with a prolonged clapping, which showed the extent of their appreciation.

After the several speakers had concluded a flashlight photographer celebrated the occasion by "snapping" the gathering.

The work on sale was really excellent, handwork of fine linens, cooking, cakes, etc., and candies.

Afternoon tea was served in a little alcove, and the guests were waited on by bright, pretty girls, who seemed happy and normal in all respects, the only clue to their common affliction being their silence and the wonderfully rapid play of fingers and wrists.

—*B.L.*

Salvaging Civilization.

"Is our civilization a failure, or is the Caucasian played out?" This question was asked in jest some fifty odd years ago by the "Truthful James" of Bret Harte. Quite a number of philosophers are now asking it in earnest. Mr. H. G. Wells has written a whole book called "Salvaging Civilization" to demonstrate that our modern social structure is trembling on the edge of an abyss; and in the October "Century" a summing up of forebodings is given. Professor McDougall, of Harvard, asserts that "the United States (and inferentially all advanced communities) is speeding gaily with invincible optimism down the road to destruction." R. H. Johnson declares that the intellectual classes are becoming sterile, while lower grades remain of unimpaired fecundity, and their progeny will swamp all others. Lothrop Stoddart and Clayton S. Cooper allege that of 1,700,000,000 inhabitants of the earth only 200,000,000 are white, and believe that the yellow and coloured races will inevitably overrun the earth. They are increasing far faster, and becoming "colour-conscious." Morris and Day severally calculate that man has probably reached his highest point of evolution, and that degeneracy and decay are already heralding their irresistible approach. Will Irwin predicts that a greater war than ever is not far off; whole cities will be poisoned off in a few hours by poison gas bombs, and that no means of destruction, even poisoned water, disease germs and doctored tobacco, will be considered too vile for use. One or other nation in desperation will resort to such lethal abominators, and others compelled to imitate.

This is an appalling outlook—if true. But let us not lose heart and hope. Let each join the optimists. Let each in his own way, however humble and imperfect, work for the good of all, inspired by faith that after all man will prove only a little lower than the angels rather than only a a little higher than the animals, and that a bright future will chase away the shadows which darken our present day.

—*T.J.H.*

March of Radio.

Marconi presages that within a few years New York and Chicago will be talking by telephone to London, Paris and Berlin. If anyone ought to know, it is Marconi. He believes that the advancement will come through the development of the electron tube, an instrument which compresses huge volumes of power into a small space, so that messages may be hurled through the air with such a force that nothing can stop them reaching their objective. The "short wave," which was his first experiment, and to which his heart turns back, has succeeded in casting messages one hundred miles in the desired direction by his "searchlight" method, and from this he is now occupied in devising means of live-saving at sea.

Marconi's first great triumph was at New Brunswick, in the United States, for from this plant was transmitted the first commercial message to cross the Atlantic from America. Recently he inspected the cross-Atlantic radio transmitting station there (rebuilt three times since the days of those almost alarming experiments), and

he predicted that although the new plant had cost five hundred thousand dollars it would be out of date in ten years.

—*M.M.*

Slaves to Convention.

There does not appear to be any connection between clothes and cremation. Personally, I do not believe there is. But both come within the category of circumstances that are dominated or regulated by convention and fashion. There have been dress reformers with us since time immemorial. The unfortunate Chidley was a martyr to his creed of practically no clothes at all, and was immolated on the altar of convention. While Chidley wandered cool and comfortable on a blazing forenoon the world, swathed in stifling garments, perspired miserably, and called him mad. In these later days a politician has discarded many superfluous habiliments to the music of an outcry of ridicule. Fashion's tyrannical decrees forbid any trifling with man's raiment, and so we will continue to sweat and swear.

Fashion's decrees about death are also inexorable. The dear departed must be interred deep in the ground with due pomp, ceremonial and reverence. No matter how unhealthy may be the practice, no matter what horribly infectious disease may have cut down the cadaver, the mass of corruption must be consigned to the grave. And if the seepage of wandering waters in time bring the germs to the surface to slay other victims what matters it! Cremation is simple and healthy. In other countries it is the popular form of disposal of "remains." But Fashion will have none of it in Australia.

—*G.B.*

Hospital Handicrafts.

Rudyard Kipling must have had many of us in mind when he composed that beautiful song, "*Lest We Forget.*" "*Requiescat in Pace*" seems to be a motto sunny Sydney-siders are content with.

How many of us have remembered the disabled soldiers, and are doing anything for them?

There is a room at No. 7 Wynyard Street to which everybody at least owes a visit. There are hundreds of beautifully fashioned artistic gifts, all the work of disabled soldiers. Prices are entirely reasonable, and well within the reach of the most meagre purse. Some of the pretty leatherwork calendars, suitable for Christmas gifts, and especially for overseas, are priced as low as ninepence and one shilling. The leatherwork in particular is excellent. There are some beautiful picture frames beautifully carved, also bags, purses and wallets.

The pottery work has a double appeal, for it is the work of the "double amps," men who have lost two limbs, and who travel to and from their work in wheeled chairs and specially constructed motor cycles. This work includes some beautiful shallow flower bowls and quaint jugs.

There are some delightful net swings, which the children will love, the work of a blinded soldier, who is also responsible for some handsome bags in coloured thread and silk.

Other seasonable gifts comprise beautiful necklaces in beadwork and real tortoiseshell.

Those who buy their Christmas gifts from the disabled soldiers will feel a double satisfaction, for they will be pleased with the quality of the gifts, and also they will feel that warm inward glow that comes from trying to assist a worthy cause.

—*B.L.*

Music is one of the most magnificent andand which I do not know to this day.—*Carlisle.*

delightful presents God has given us.

* * *

The man who confers a kindness should be silent concerning it; he who receives it should proclaim it.

* * *

Why did somebody teach me the constellations and make me at home in the starry heavens which are always overhead

* * *

God grants liberty only to those who love it, and are always ready to guard and defend it.—*Webster.*

* * *

It is only necessary to grow old to become more indulgent. I see no fault committed that I have not committed myself.

"Twelve Men"

By RICHARD THORNE

THE Sixty-third Battalion had fought its way steadily north. Since leaving Capetown many of the company had dropped out, some to recuperate and return to the line, some to return to Australia, and some to sleep in quiet dongas for ever.

Hawkins was added to the strength early in the war, and the longer he remained the better he was liked.

In his blue-grey eyes and on his lips was a constant, good-natured smile. His hand was at all times stretched out to help a comrade.

On the march he would yank the pack from off the shoulders of a tired man and carry it with his own till the comrade begged to have it back.

In a scrap his powerful arms pulled many a hurt friend into cover. And in the camp he pottered round continually doing little kindnesses.

Although he never spoke of it, it was known that Hawkins had a "past." Not a social "past," but a military one. That is to say, he had previously fraternized with the enemy.

* * *

In fairness to Hawkins, his story should be set out in plain terms. "Nothing extenuated, and nought set down in malice."

At nineteen years of age he had left England and settled in Dutch territory. There he married a Dutch girl, and was, as farmer, engaged in rearing a family, the two eldest of which were girls.

For reasons as far beyond his control as the ordering of the stars, war was declared by his country on that of his family.

Hawkins was the family name of a long line of warriors who sprang to attention immediately the bugle call of England sounded, so that in this instance the bugle brought a pang to the heart of a Hawkins. Earnestly the family debated this question—openly and in all fairness.

Hawkins told, as he had a hundred times before, that "his" country conducted war on a high and honourable plane. That at the conclusion there would be some governmental changes. But on the whole all would be much the same.

So he went south.

* * *

For months, or was it years, the war dragged on, ever increasing in bitterness.

There was a decided changing from the highly ordered method to the irregular or "guerilla" type of warfare.

Then came certain reports. Nasty fugitive messages that made men wish they had escaped them.

They were denied, but again they came.

Pianos were damaged. The exigencies of war made the removal of furniture a necessity. Farm houses were caught in the line of fire. Women were escorted from place to place. Altogether the intelligence was of a painful nature.

The good-natured smile had gradually faded from Hawkins' face from the first whisper of those things.

Then, one night a Kaffir slipped a missive into Hawkins' hand, and the darkness swallowed him up.

Routine orders saw him "posted" in stern official lines. But among those who knew him best his name was spoken gently.

And still the war dragged on, ever increasing in bitterness.

One evening the weary troops bivouacked at the foot of a hill to rest after a galling march.

At nine o'clock Lieutenant Hanlon strode among the half sleeping soldiers giving short, peremptory orders.

"Twelve men. At Daylight. Firing party. You, Butters. You, Furguson. You, Harris!"

The officer indicated each man with a finger point as he named him, and was gone.

* * *

In the grey light of morning a group of men assembled outside Lieutenant Hanlon's tent. Each took a rifle from a pile, as directed, and fell into line.

"By the left. Quick march!"

Twelve men marched up the hill.

As they neared the summit they were joined by two men carrying shovels. A few slinking kaffirs hung round like crows, trying to look unconcerned.

Rapidly along the hillside strode an Imperial officer, and behind him an armed guard of four—with the condemned man between.

There was a swift salute by both officers, but neither spoke.

The superior officer indicated a certain spot, and the guard, without deviating a stride, walked on to it.

"By the right. DRESS!"

Twelve men clicked into line. The guard spread out, and the condemned man looked straight at the rifles.

"God God! It's Hawkins!" gasped the man on the left.

Hawkins' hand flew up to the rim of his hat in a friendly salute to his old comrades.

There was a quick tug at the heart of every man in the line.

"Over his head!" gasped the man on the left.

"Bet your life'!' from the man on the right.

Twelve men had resolved.

"Present arms! *Fire!"*

Hawkins remained erect a very brief instant. Then he crumpled forward on to his knees and his face.

"Left turn. Quick march!"

The firing party was momentarily halted some few paces distant.

They nudged one another in mutual congratulation.

"What a fall," said one.

"Natural as death," said another.

"He's all right," said a third.

Bang! Their heads swung round together.

The Imperial officer was holding a smoking pistol at Hawkins's ear.

His legs quivered, and his hands clutched the grass at each side.

"By the left. Quick march!"

Twelve men marched down the hill.

A HAPPY NEW YEAR.

"A Happy New Year!" is my wish to you,
Though the wish is centuries old,
For the lips that spoke it to friends they knew
Have long since sweetened the mould.
A Happy New Year! 'Tis a greeting wet
With the dews of a purpling dawn;
For last year's suns are for ever set,
And the world swings into the morn.

A Happy New Year! It is ever thus,
Though we speak of the good old days,
And we see the time that is lost to us
Through a mellowing, golden haze;
Yet, with kindling eye and with hearts aglow,
We wait what the new years bring,
And the old years leave us, as they go,
Athirst for some far-off spring.

Is it true that we're better than other times,
Or wiser than our forbears?
Is it true that man steadily upward climbs
With his fated burden of cares?
I doubt it; and ever I doubt it more,
Though the distant hills look green,
For the days that the future holds in store
Shall be like to what aye has been.

And yet—for Hope never dies—to-day
I frame the old wish for you;
If the old year's skies were o'ercast and grey,
May the sun shine bright in the new!
I wish you God's blessings abundantly,
His love and His holy fear,
For thence must come—as it seems to me—
A happy and bright New Year.

ANON.

THE previous evening had been a stormy one. The nor'-west season was in full blast, and eleven inches of rain had fallen during the night. Morning dawned with a clear calmness only to be seen in the tropics, and there was not a ripple on the glassy sea.

From my paper-bark hut under a clump of pandanas palms a glorious sandy beach extended for many miles, and merged in the distance into a forest-clad, rocky cliff series of ranges. My black boy, Moses, who had arisen at sun-up from his gum-leaf and ash-bed couch, was now busily engaged tracking up a possible breakfast, a wandering iguana.

The scene springs into action. Goanna sprints and Moses sprints after it, his shirt tails streaming out behind skinny shanks. He pursues the reptile with long, leaping strides, and a thumping big club grasped in his eager hands. At the foot of a cliff from under a boulder a cloud of dust arises, out of which the grinning boy emerges and drags a limp reptile up to a blazing camp fire.

Moses is a good boy; part of his mission training still clings to him. He is a great and faithful believer in the Sabbath as taught by his former teachers: "On the seventh day shalt thou rest." Almost every day he asks me, "This one day Sunday day?"

Search for a Dinner.

He breaks his fast on semi-grilled iguana, and I go down to the beach seeking that which I may find. Of oysters round about me there is an unlimited supply. Wading chest deep in the clear green sea, I note some of Nature's handiwork on the bottom; marine flowers of every shape, size, form and colour are waving gently. Stolid, bright-shaded vegetables of enormous size are growing amidst a confusion of quaint coral rocks and boulders. Darting about, and pausing now and then to have a look, are myriads of red-banded blue and gold, black and yellow fishes. Suddenly they discreetly disappear amongst the giant clams and shells.

An Octopus Appears.

Sticking out from under a "Brain cell" coral formation, I see several long, creeping tentacles. With my single-pronged spear I drive underneath. There is a scrunching sound, and then a mass of ink-black fluid floats out, followed by a writhing grey creature, which rapidly darts away backward, leaving a trail of darkness to cover its retreat. It is an octopus, giant squid, or devil-fish. The long tentacles when well boiled make a fine stew.

Going further out, I put on a pair of water eyeglasses, and, with face flat on the surface, I swim around. Two eighteen-inch-long whiskers are being held up enquiringly amongst the tangle of sea growths. Half swimming, half wading, I silently approach. Using my spear like a billiard cue, I make a jab. Screeching, subdued shrieks arise. Small sharks dart in from all directions, but, seeing me, they pause, size up the position, and flash away back to the deep waters alongside the reef.

Carefully upending the spear, I grasp a flopping lobster by the back. It vigorously claps its tail on to its body, hoping thus to impale my fingers between its spiky crests. My boy comes out, takes the creature, breaks off its two long, stiff whiskers, and drives these into the tail of

the fish. This prevents the lobster from moving about when placed on a nearby rock. In about half an hour we had landed twenty-two of these, and put them away in a rocky pool for future use. We walked along the sand beach to where a three-foot-wide track extending from high water mark to a sand hillock and then back again in a V-shaped formation attracted our attention. It was a turtle track, at the apex of which we searched, poking sharp-pointed sticks into the sand. In a scooped-out post hole we found the eggs, tennis ball like in shape, and of a tough flexible exterior. These turtles are champion egg-layers. In one night this one had laid nearly a gross of eggs. Lighting a fire, we grilled some of these and made breakfast.

So far we had eggs and crayfish for our prospective dinner. For meat we decided to go inland and get some pork. Around about a salty claypan we picked up the tracks of a sow and several porkers. These we followed for some miles, walking cautiously and silently, as these wild pigs are known as "runners." Once they started to run they would probably keep going until they reached the shores on the other side of Australia!

"Dinkum," true to cattle dog style, rushed forward silently, and then out of a clump of fresh water mangrove squeals arose. "Dinkum" had a grip on the pig's hind leg. Leaving them to argue out the matter, we scouted about for the hidden youngsters. I sighted one swimming across a pool of water. Jumping in, I sank up to my waist in slimy mud, but I managed to get hold of the struggling porker. By this time we were in a fit state to have a refresher, so we wandered down to the surf.

Spearing a Stingaree.

The tide had turned, and was running fast up all the channels and creeks. Moses had sighted a big stingaree, and as he did not eat pig wanted this as a substitute, so we waded out. The big creature was lying flat on a sandbank under two feet of water. Slipping the throwing stick on to the spear, the boy drove it viciously into the mass of meat. I stood ready in case the bad tempered thing charged, but away it darted, a swiftly moving shadow, the spear hissing along the top of the little waves. Two hundred yards away a wicked looking fin rose to the surface, paused, and then swiftly tore along towards us. On both sides of this oncoming fin the water curved in graceful lines. We were up to our necks in water, with the shore half a mile away.

An aboriginal fishing in a freshwater creek.

A Collection of Turtle Eggs.

For a moment we scarcely realised that our position was one of very great danger. We started to walk backwards, the black boy's eyes gleaming with fright—one of his all-too-light reed spears ready to strike. Splashing and yelling, we faced the grim, shadowy shape as it circled round and round us but three yards away. Then it paused, head towards us, and the fin again slowly came to the surface. A moment afterwards it began to follow up what was evidently the trail of the wounded stingaree.

Mortal Combat.

Zig-zagging about in and over a shallow sandbank, the shark hunted like a well-trained hound. Then it paused, darted off a hundred yards, and started a tornado of splashes, thumping up and down. He had found the stingaree, which to escape danger had dug into the soft sand, and was now lying flattened out on the bottom. The shark was pounding the wind out of him in an endeavour to create enough turmoil to make this three hundredweight meal rise to the surface.

The splashings and bangs could be heard a considerable distance away. The stingaree shot to the surface, and, gathering momentum, hydroplaned along the top of the sea at about forty miles an hour. Out into the deep water it went; then the shark leaped above the surface, a grim mouth turned slightly and grabbed the fast speeding enemy. With huge, helpless, flopping wings, the stingaree was dragged down and out of sight. Mr. Shark had caught his dinner.

Thankful that we had not figured on his menu, we made haste for solid ground. The very much mixed bathing in these seaside waters was too mixed for my liking. Alligators, sharks, stingarees, devil-fish, sea-snakes, etc., do not help one's system to a nerve cure. On the way back to the camp we collected some wild fruits for after-dinner dessert.

My black boy searched diligently in his woolly head for small articles planted there, and produced a penknife, stick of tobacco, piece of newspaper for cigarettes, and several wax matches. He dined on cold roast bandicoot only. The previous day he had tried to get a 'possum, but it had gone up a gum tree, which was too big to cut down, even at the price of getting this appetising morsel.

Frequently after partaking of my midday repast my mind would revert to the happenings of other days. At such times a great longing for companionship overcame me—the companionship of good books.

The loneliness of a big city is, however, far worse than that of our vast bushlands. The dingoes, the emus, the kangaroos are all brothers to the man who, through forest study, has gained access to the freemasonry of the bush.

A Cyclonic Waterspout.

A rattling crash of thunder awoke me from my noonday nap. Vivid flashes of sheet and chain lightning glared and darted amidst a rolling mass of storm-rent clouds. A cyclonic waterspout was advancing across the open sea. A steady roar as of a mighty conflagration intermingled with thunderous boomings and ear-splitting crashes. The concussion shook the ground. The camp had been so constructed as to be sheltered away from these nor'-westers, so I awaited the onslaught of the hurricane in peace.

A deluge of rain swept down, and for an hour I could not see three yards away. After the storm had passed over roaring

muddy seas rent the beautiful beach to pieces, and then, towards evening, calm once more settled over the scene. About sundown several turtles kept poking their inquisitive heads cautiously above the sea, and two dugong rolled and dived about near a little rocky cliff.

Moses had a tiny bark canoe stowed away in a small tidal creek, and in this we paddled out, intent on an evening's entertainment. Genuine turtle soup is good, and dugong meat will keep for weeks. Moses stood up in the bows with a spear like a clothes prop. On the end of this was a six-inch nail, attached to which was what looked like a clothes line, but was really a rope made by Moses from the fibre of the bark of a messmate tree.

We drifted on with the fast-running tide. Turtle were popping up, and then diving down to feed on the water grasses. Looking over the side of the canoe, I could see one outlined in phosphorescent glow. Long comet streams of fire made apparent the outlines of a fast swimming fish. A dark body heaved to the surface almost under our bows.

The Art of Turtle Catching.

Moses struck with his clothes prop, at the same time falling overboard so as to put the full weight into the blow. Grabbing the paddle, I turned the canoe against the tide. The boy, according to his usual practice, managed to grasp the turtle by laying out full stretch along its back and holding on with both hands to the fore-end near the flappers, thus preventing it from diving.

Ranging up alongside, I tried to hold a portion. A snapping, horny beak made me quickly change my mind. I got hold of the line, and tried to keep the canoe stern on, but the line parted. Moses lost his grip, the turtle dived, and the prospect of turtle soup went with him. Moses got a nasty cut on his hand, probably from a barnacle on the tough shell.

We went back to camp. I crept under the cheesecloth net, and was lulled to sleep by the shrill music of mosquitoes, intermingled with the howling of dingoes and the screeching of curlews. The soft, gentle lapping of a tidal tropical sea played a constant accompaniment to the harsher sounds around me.

A Good Season.

THE CALL OF THE GOLDEN WEST

WEST AUSTRALIA AS A TOURIST RESORT

GLORIOUS SCENERY — WONDERFUL CLIMATE

By S. J. HAYWARD
Director Government Tourist Bureau

ON maps of Australia a century or so ago the information was extraordinarily scanty. The great island continent of New Holland—as it was generally called—was a mere coast line, and where physical features were indicated the lines were singularly broken and indefinite. Upon later maps there are evidences that Eastern Australia had been in part gone over and its main features noted and named, but Western Australia for long remained a *terra incognita.* Almost up to the time of Federation the interest taken by residents of the Eastern States in the great western portion of the continent was remarkably small. When it was found that the country was phenomenally rich in gold people in the East woke up to the fact that Western Australia, after all, was worthy of consideration, and they flocked there in thousands, attracted by the lure of gold. But to say, even to-day, that Western Australia is well known to those living in the Eastern States would be to strain language. To the great majority of them it is still an unknown land—a country to which Nature, except in the matter of gold, has been unkind, and where civilization has scarcely yet passed out of the wild and woolly stage.

Mr. S. J. Hayward.

The facts are quite different. Western Australia has been splendidly endowed with all those characteristics that make for beauty and charm. There is none of the States to which the phrase "A Land of Opportunity" may be more fitly and truthfully applied. And opportunity in the big Western State is not confined to agricultural, mining or industrial pursuits. It is there in marvellous abundance and variety for the tourist, the holiday maker, and the seeker after health. The tourist from the eastern side of the continent has scarcely yet discovered Western Australia.

Let us, in the first place, look broadly at the attractions that Western Australia offers residents of the East in search of a pleasant and enjoyable holiday amid entirely new surroundings. To get to Western Australia from the East involves a fairly long journey either by sea or rail. If it be decided upon to make the trip by water there is a ten days' sea voyage from Sydney to Fremantle, forming by itself a valuable holiday, and one taken under conditions eminently suited to health and enjoyment. The calls of the vessel at Melbourne and Adelaide offer many desirable opportunities to travellers, such as could not be experienced during a holiday confined to one State only, and the trip across the Bight is in

itself an ocean voyage. If the journey be made by rail, the crossing of Australia from east to west is an event to be remembered. The visitor will see a part of the Commonwealth that is little known, and he will be able to note much that is new and strange to him. At Kalgoorlie, where the Trans-continental railway joins up with the State system he will have an opportunity of seeing gold mining operations on a vast scale. And here, too, he will be able to form some idea of the meaning attached to the word "progress" in the Golden West. A generation or so ago the area upon which the Golden Mile and Kalgoorlie and Boulder now stand was a mulga waste, over which white explorers had travelled, but had observed nothing that was uncommon. Then came the daring prospector and the finding of gold. In an incredibly brief period makeshift townships were in existence, and in a dozen years or more two large towns had come into being, fully equipped with such modern conveniences as electric light and tramcars, with very fine buildings and a plentiful supply of water, brought from the Darling Range, some 350 miles distant.

Western Australia is impressive in its vastness. Its area is 975,920 square miles, or more than eight times that of the United Kingdom. In the mountain ranges of the north there are many prospects of unsurpassed beauty, and there is tropical river scenery that is magical in its enchantment. But conditions in the far north are not yet such as will permit travellers to enjoy those comforts which tourists expect. Until these are provided the north must remain closed, except to the hardy pioneer and the explorer.

The south-west of the State holds the greatest attractions for visitors. The whole of that region may be regarded as one vast tourist resort, so richly is it endowed with what holiday-makers appreciate most. Perth is unique among Australian capitals. It is surrounded by natural beauties, and from the cliff-brow of its King's Park there is spread a panorama, the picturesque beauty of which is exceeded by no other city vista within the Commonwealth. Below lies the great river-reach, known as Perth Water, into the far side of which runs the Canning River. The prospect to the east is unbroken up to the Darling Range, which, with a purple haze shroud-

Government House Grounds, Perth, W.A.

King River, Albany, W.A.

ing it, forms the eastern horizon. Perth is justly proud of the Swan River. It provides facilities for sport and recreation to a degree that is not enjoyed by any other city in Australia. It is Perth's most important lung, and the citizens make the fullest use of it. The river beaches are among the most popular resorts in the State. Of the twelve miles of river between Perth and Fremantle fully five-sixths is hard, yellow sandy beach. Both sides of the river are dotted with residential townships, where every accommodation is available. On the north bank is Crawley; lower down is Nedlands; then come Claremont and Peppermint Grove. On the south side are South Perth, Como, Canning Bridge, Applecross and Point Walter. Bathing and boating claim thousands, while the wide reaches of the river are made vivid by the white wings of many yachts. There are other beaches on the west and southern coasts, which vie in popularity with those on the river. Fremantle, at the mouth of the Swan River, has two beaches, to whic crowds of visitors flock. Further south, at the Naval Base, at Rockingham, and at Mandurah, are splendid stretches of glorious sand, and still further on, at Bunbury and Busselton, are beach resorts that are deservedly in public favour.

There is nothing in Australia to equal the south coast of Western Australia in the feast of good things it offers to tourists. There the visitor finds himself in close communion with Nature, for only at sparse intervals is there permanent settlement. The inlets of the south coast are like the fiords of Norway, softened by warm breezes and lit by brilliant sunshine. These inlets are a veritable paradise to tourists who love the open and are willing to vary the monotony of city life by camping out. There are not railways to the most picturesque and attractive of the inlets, but there are roads, and supplies of necessaries can always be obtained. The Tourist Bureau in Perth can make all arrangements for the comfort of parties who wish to visit the beauty spots on the south coast.

Perth is the centre from which a large number of enjoyable trips may be made. The Darling Range is only about 20 miles to the east, and every mile of it has something worth seeing. The "hills," as the range is known locally, are well provided with all facilities required by tourists. On the slopes is a succession of fine orchards and vineyards. An attraction which none should miss is the Mundaring Weir. This huge reservoir was formed by damming back the Helena River. The reservoir has an area of about 600 acres, and holds 4,650,000,000 gallons of water, and from it the Eastern Goldfields are supplied. The pipe line (30 inches in diameter) is 380

miles long, and delivers water at the rate of 4,000,000 gallons a day. In winter, when the rains fill the reservoir to overflowing, the weir is a constant lure to dwellers in the metropolitan area, and special trains are run for the convenience of sightseers. The Mundaring Weir and its long pipe line form one of the world's greatest water schemes, and to it the development of the Eastern Goldfields is largely due. The cost of the scheme to date is three and a half millions sterling. Behind and to the eastward of the Darling Range lie the big stretches of fertile land which form the famed wheat belt of the State. Throughout this area are many pleasant townships, all offering attractions to visitors. This class of country continues eastward almost as far as Southern Cross, where the gold mining district known as the Eastern Goldfields begins. There is much of interest to be seen in the wheat belt, but the State's most picturesque spots cluster in the south-west division, that is, in the big area from Perth to the Southern Ocean. Here there are mountain valleys and pleasant streams, in addition to the great forests which form so important a part of the State's natural heritage of wealth, and, also, not forgetting the world-famous Cave Country.

Mundaring Weir, W.A.

Western Australia is endowed with a wealth of beauty spots, but its wonderland, par excellence, is the ever-attractive and fascinating Cave Country. Over a considerable section of the south-west there are series of caves of surpassing interest and beauty. Many of these caverns are of vast extent, and their interiors are a succession of dazzling fairy palaces. There are constant vistas, whose marvellous imagery fills beholders with delight. The strange forms assumed by the stalactite screens and pillars sometimes imparts a feeling of unreality, and the visitor finds himself wondering whether he is looking on something that really exists or gazing upon a series of weird and fantastic pictures. These caves tell a story which the trained geologist can understand and interpret, and it is one that places the age of the south-west of Australia far back into early centuries. Any visitor to the West who does not include the Caves in his itinerary is missing a veritable feast of wonders. These caves are situated at Yallingup, nineteen miles from Busselton, a town on the coast, 149 miles south of Perth, and reached in a few hours by rail from the capital. About thirty miles from Yallingup, and accessible by a fine road through beautiful country, are the Mar-

garet River Caves. Of these the most spectacular is the Lake Cave. This is now lighted by electricity, and presents a fairy scene that suggests the revels of Oberon and Titania, and their myriad attendants. Within easy distance of the cave country is Augusta—one of the oldest settlements in Western Australia—and Cape Leeuwin. Near the former, which is a charming township, with good accommodation for visitors, is the Coronation Cave, said by experienced travellers to rank among the finest of the world's cave wonders. A further attraction in the south-west of the State is imparted by the great forests of Karri. The Karri is probably the largest tree in the Australian continent, and specimens may be seen up to 300 feet in height, with diameters up to 10 and 12 feet.

If Western Australia has an abundance of beauty spots for the tourist, it is also the State which provides to the adventurous the greatest opportunities for leaving the beaten path and travelling along those that are comparatively little known. To the person whose tastes lean towards sport, or who is of a studious turn, the south coast of the State holds out powerful inducements. There is first-class shooting to be had along the inlets that pierce the land at intervals from Cape Leeuwin to King George's Sound, and in these inlets, too, the fisherman will find a happy hunting ground. From Albany, on King George's Sound, steamers ply at regular intervals to Hopetoun, Esperance and Eucla, the latter being the border town between Western Australia and South Australia. At all these places the sportsman will find ample opportunities for the exercise of his skill amid surroundings that are new and unhackneyed. From Esperance a traveller may proceed, partly by coach and partly by rail, to Coolgardie, Kalgoorlie and Boulder, the centres of the big Eastern Goldfields. As a holiday field for residents in the Eastern States Western Australia has an undeniably strong claim. To the vast majority of the people in the East it is an unknown country, but on that is able to richly reward visitors. There is no better climate in Australia than that of the southern part of the Golden West, where the conditions are similar to those of the south of France. The Great West is a country of magnificent distances, and it would be strange indeed if these were not liberally furnished with the things that excite the admiration of travellers. And to the Easterner a trip to the west has this added advantage, that it may include a fairly long sea trip, and it leads to an environment that has all the novelty of foreign travel.

THE FEN.

There waiting for the windy spring,
Through the long winter falls,
The little drowning houses cling
About the manor walls.

And miles on miles of meadows wake
With blare and blaze of pomp
And buttercups and kingcups make
One gold, gigantic swamp,

And round the carts with old reed-loads
The black dust clouds ascend
Along those dark, eternal roads,
Beyond the evening's end.

And there, like free and noble thought,
White windmills, swinging fair,
Tell of the work that man has wrought,
To all the wandering air.

There by the dykes at term of day
The traveller may behold
Cattle at graze against the gray,
Fat geese against the gold;

Till on the silence of that plain
A deeper calm is shed,
And all the marsh becomes again
The Fenland of the dead.

The airy gay, the light blue day,
Long years ere he was born,
When full-rigged four-mast schooners lay
Snugly along the corn;

Till he, so wandering, half at loss,
Shall mark nor house nor tree,
But centuried ghosts that cry across
That bled and beaten sea.

DOROTHY WELLESLEY.

He of the Glass Heart

By GEORGE ALLAN ENGLAND

WE had just lost our routine game of whist in the smoke-room of the *Titanica* — my travelling companion, Maynard, and I—and had set up the nightly ale for Harrison and Dr. Carmichael, our victors. Tobacco thereafter appeared.

The bright electric clusters overhead, the leather divans and nicotin-scented warmth, contrasting cheerfully with the January bluster of mid-Atlantic, inclined our hearts to narration. All four of us settled down for a good "gam." Men never talk so well, I think, as when the gale is picking at the harp of the rig, the woodwork straining, and the surges slewing thunderously 'longside in the dark.

Thus we spoke of many subjects, and the talk veered at last to the power of mind over matter. Whereat Dr. Carmichael most entertainingly made speech.

As I recall it his tale ran somewhat in this wise:

Hardly had the intruder opened the door and quietly stepped into the laboratory when Ackroyd glanced round with surprised vexation. For the master mind of twentieth-century electrical science hated interruption above all things. He failed to understand how this tall, stern-featured man, so ominously intense, had managed to slip past both the lodge-keeper and the laboratory guard.

So, standing up quickly beside the littered experiment bench that ran along the whole north wall of the room, the wizard crossed his shirt-sleeved arms, clamped his teeth still tighter on the old cob which was his consant solace, and from beneath frowning brows peered with hostility at the newcomer.

For a moment neither spoke. By the light which glowed greenly from the vacuum-tubes about the ceiling of this windowless den each studied the other. Then the stranger closed the door and came forward.

"Pray pardon this rudeness," said he in a deep, courteous voice, which, nevertheless, trembled a bit. "I know how very unwelcome I must be. Still, I am here. I had to come!"

"How the deuce did *you* get in?" snapped the scientist.

"Oh—just a little strategy. Nothing simpler. But let's waste no time on that. I've something far more vital to discuss. And every moment's precious. Now I—I—"

He stammered with sudden emotion. Ackroyd perceived that he was holding composure only by a strong effort. Removing the pipe from between his teeth, the scientist stared in wonder, trying to determine what manner of fellow this might be. A professional man, to be sure. Maybe a writer. Ah! Perhaps he wanted an interview.

"Sorry," blurted Ackroyd; "but if you want to write me up, or anything of that sort, I can't see you. Nothing to say. Positively nothing." And he made as though once more to sit down at his work-bench.

The stranger raised an imploring hand. Ackroyd noted how long and fine the fingers were—white, supple, and adorned by but a single plain gold ring.

"Pardon me again," said the intruder. "You mistake my errand. It isn't an interview I want. Why, I never wrote a line for publication in my life. I want just a few minutes of your time, at your own price. My errand concerns something far more vital than mere curiosity. It's life or death to me. For Heaven's sake, will you hear me?"

Ackroyd, startled, yet intensely annoyed, thrust out his lower lip and began pulling at it—a way he had when particularly irritated. Time, for him, had no price that could be counted in money.

Just now he was three-quarters through an abstruse calculation. This interruption of his mental process was an outrage, from his point of view—more, a crime. Any appeal to his emotions must be fruitless, for emotions he had none. The cry of sentiment curdled his soul. He hated it. So with raised palm he motioned dismissal.

"Can't see you," he decided. "Good day."

The stranger, paling, clenched both fists.

"You must!" cried he.

"So?" sneered the Wizard. "That's a new word to me." He reached quickly for a push-button close beside his chair.

But the stranger, with a sudden gesture, tore open coat and waistcoat, ripped his shirt apart, and on his naked breast exposed a singular object.

Ackroyd, his eyes narrowing slightly, stood still. His finger did not press the little ivory knob. Thus, for a second, the two men confronted each other.

"Well," cried the scientist at length, "what is it?"

"Listen. If you send me away without hearing me," replied the intruder in eager haste, "you'll miss the greatest—"

"Oh, so you're another crank, eh?" sneered Ackroyd, with a cynical grimace. " 'Greatest scientific marvel of the age,' and all that sort of stuff, eh? That's what they all say—such of 'em as I can't dodge! Why, we turn away, on the average, five or six greatest marvels a day. So I tell you, to begin with—"

"I've got a glass heart!" cried the stranger. "Will you listen to me now?"

II.

For a moment Ackroyd stood dumb. Then: "A—*what?*" he ejaculated. As he spoke the idea "Madman" crossed his brain. But even so, despite himself, he was startled out of his aplomb. "You mean to say—"

"I do. I repeat it. My heart's made of glass. An artificial heart, mechanical, automatic. Made by Kohler, of Vienna. Put in by Klugermann, of Bonn. And operated by this." He tapped the box-like affair strapped to his chest. "Do you want proofs? I've got them. Only listen, I tell you. You can at least do that. As a man of science, you're willing at least to hear what other men have done, aren't you?"

Ackroyd replied nothing, but stood studying this singular individual. He noted the high, somewhat wrinkled forehead, the stiff black hair already retreating before the attack of baldness, the aquiline nose, and sharp, intelligent eyes. Then, with a smile, he jibed:

"Not dangerous or violent, are you? Merely harmless, I take it. Because, you see, that's important. I may as well tell you right now that I've got a gun in the table drawer, and I can hit a dime nine shots out of ten at a hundred feet. Also, there are—well, other devices in this laboratory which might embarrass you in case you tried to start anything. So, go slow."

With an expression of intense chagrin the stranger drew from his pocket a neatly folded journal.

"You read German, of course?" asked he, ignoring the insult.

Ackroyd nodded.

"Very well. Look at this copy of the *Wissenschaftlicher Rundschau.*"

The scientist, bitterly scornful, accepted the paper. He glanced over a page or two. A one-column article was blue-pencilled. As he read the headlines his face became a study.

NEW TRIUMPH OF MODERN SURGERY.

Radical Cure of Valvular Degeneration by Klugermann's New Method.

LARGER ASPECTS OF THE RUSSELL CASE.

For almost the first time in his career wholly at a loss, Ackroyd dropped the medical journal on his table, sat down

heavily, and, leaning forward with a hard, stern look at this astonishing visitor, demanded:

"Well? For Heaven's sake, man, what is it all about? What do you want of me?"

"I'm Russell, to begin with," answered the other. "Francis H. Russell, of Toledo. And, as I said at first, I want just a few minutes of your time."

"All right! All right! Go ahead!" the scientist exclaimed, his voice betraying more emotion than in years. "Let's have it!"

"At your own price?"

"Price? What do *I* want of money?"

"It's useful, at times. Allow me." And Russell, taking from an inner pocket of his disordered clothing a morocco wallet, extracted therefrom a fat stack of bills.

He laid the money on the table. Ackroyd, glancing involuntarily at it, saw that it must total several thousand dollars. He started to sweep it into the waste-basket, but with a sudden change of mind dropped it into the drawer.

"New laboratories," he remarked. "Well?"

The client drew up a plain wooden chair and sat down. Ackroyd noted that he seemed in pain, rather short of breath, and rather pale. But to this he gave no heed. His whole thought now was of the incomprehensible problem before him.

What to think, he knew not. Whether to believe or doubt, he could not tell. He waited. His eyes fixed themselves upon that curious flat box which partly showed through the man's torn clothing. Russell noted the look.

"This," said he more calmly, "is what I came to consult you about—this apparatus here." He tapped the box. "I've got to consult you about it. Knowing the futility of trying to make any appointment by letter, I did the next best thing—waited my chance and forced myself on you. Forgive me! A man will do anything almost, even the most distasteful things, to save his life."

An old-time picnic scene on the Richmond River, N.S.W.

"You mean—"

"I'm in great danger. Deadly peril. And only you can save me."

"How so?"

"I'll tell you presently. Just a few words first. Who I am doesn't matter. An American, rich, with children and big business interests. Only fifty-two. Much to live for. Years and years of usefulness still ahead of me, if you help me. So much for that."

"Yes, yes! Go on!" And Ackroyd, whom not even the keenest interest could long divorce from his tobacco, reached once more for the old pipe.

"Four years ago this Spring I developed heart disease. Had the best specialists—oh, a dozen of them. No results. The dishonest ones exploited me. The others told me the truth—no hope. The most optimistic gave me perhaps three years or so to live.

"Well, I took my death sentence, and tried to bear it as best I could. And for a while things went on, getting worse and worse all the time. No matter about details. I was slowly dying; that's enough to know."

Without comment, the scientist listened. His pipe was going now. Already the air about his head was beginning to grow blue.

"What was it, Providence or mere coincidence, that put Crawford's 'Witch of Prague' into my hands about eighteen months ago? I can't say. At any rate, I read the book. Remember *Keyork Araban's* experiments? One was the keynote of my inspiration. When I read that—"

"Go on, tell me about it!"

"He describes, you recall, substituting a glass heart for the real one in a rabbit. The words branded themselves instantly into my brain. They're all there, still. *'I made,'* says he, *'an artificial heart which worked on a narcotized rabbit, and the rabbit died instantly when I stopped the machine. . . . If one applied it to a man he might live on indefinitely, grow fat, and flourish so long as the glass heart worked. Where would his soul be then? In the glass heart, which would have become the seat of life?'* "

Russell paused, unduly excited. For a moment Ackroyd peered at him. Then said he:

"So you went to work on that idea, did you, and at great expense of travel, pain, and money had this thing actually done to you? Is that, omitting all minor points, what you're coming at?"

"Exactly. How splendidly you grasp conclusions!"

"I have to in this business or quit. Well, then, what do you ask me to believe? That you've actually got a mechanical heart inside there in place of the old one? And that that's all you keep alive on?"

Russell smiled—an odd, bitter smile.

"I'm not asking you to believe anything," he returned. "I'm merely asking you to examine the evidence and judge it, as you would in any other problem. After that—when you're quite convinced—I want your help."

"How so? What's wrong?"

"The mechanism! Nobody on this side of the Atlantic can set it right except you. There's no time for a journey back to Vienna. You're the only man that can save me. If you refuse—"

"You die?"

"Like *Keyork Araban's* rabbit," assented Russell with quivering lips.

III.

Ackroyd sat frowning for a moment. Keen thinker and clever analyst though he was, this case for a little while seemed to baffle him. How explain it? If the man were only a deluded crank, how account for the article in the German magazine?

The story he told, after all, was not impossible. Though no surgeon, Ackroyd knew something of the marvels of modern medical science—the ingrafting of organs and of bones upon the living body, the stitching up of the wounded yet still pulsing heart, the seeming restoration of life by various processes.

Might it not be true? And if so, how strangely curious a thing to know about! A flash of keen interest passed through his mind. He must have proofs—then he would undertake whatever work this stranger wanted done. But, first of all, proof positiye that the thing was as the man declared.

As though reading his thoughts, Russell tapped the flat, boxlike thing upon his breast.

"Here," said he more calmly, "is the apparatus I want you to examine and repair. Put your ear over this way—so—now hear it? Something wrong, you perceive? And you're the only man in America I dare even show it to!"

Ackroyd, all attention, listened hard. From within the box, which was shallow and curved to fit the contour of the man's chest, came a slow, rhythmic sound, dull and almost inaudible, but broken now and then by a slight hitch, as though some delicate cog or gear had stuck, then gone free again. The wizard frowned.

"If what you're telling me is true," judged he, "you'd better go to a watchmaker. I'm not the man you want to consult at all!"

"Pardon me," returned the other, "but it isn't a matter of mere clockwork. Here, let me explain."

Taking up a pencil from the work-bench, he hastily, and with considerable skill, drew out a sketch of the apparatus. A strap round the body and two over the shoulders seemed to hold it in place. Within the space which represented the box itself he quickly limned two induction coils, a "U" magnet, and a variety of delicate levers and springs which served to make and break a circuit from six flat storage batteries inside his coat.

These batteries he showed to Ackroyd.

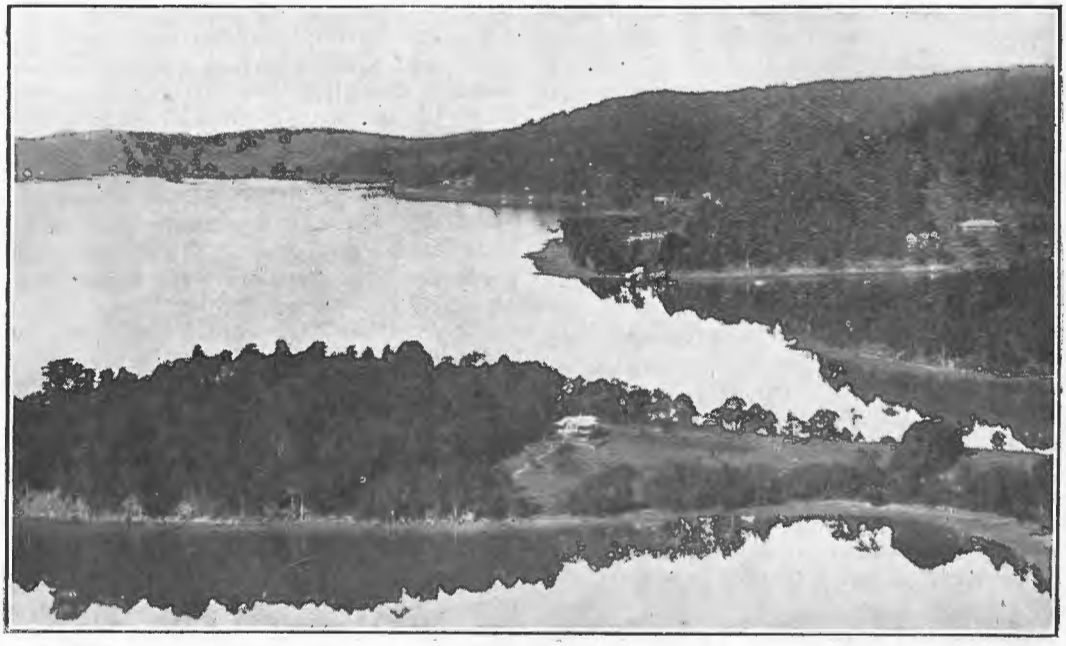
"Now you readily understand," he elucidated, "my heart can't be operated by direct transmission of power from outside. Magnetism is the only force that can do it, through the body itself.

"The valves of this artificial organ are fitted with disks of steel, capable of being attracted and released by the coils here at 'X' and 'Y.' My batteries, according to directions, I have renewed at regular intervals of one week—two batteries each time, thus always insuring a steady, uniform current.

"But in spite of all this, for ten days past something's been wrong. The mechanism's been out of order. It skipped a few times. Once I thought it was going to stop altogether. You can imagine my state of mind!"

"Well?" interrogated the scientist, reaching for another match. "So, then, you made up your mind to consult me, willy-nilly?"

"Just that. And made a record run of it, too, from Toledo! Special train from



The Peninsula at Newport, Manly District, N.S.W.

Albany. Fancy your own life utterly dependent on—''

''Yes, yes, I know. But what am I to do? Open that box, study out the apparatus, see what's wrong, and make it right! Is that your programme?''

''To a 'T'!'' replied the client, now visibly excited.

A little colour had crept into his face; his hands were working nervously.

''Precisely. And the quicker the better.'' He glanced toward the door. ''Suppose we should be interrupted! I might lose my—''

''Come, now, calm yourself!'' Ackroyd exclaimed. ''All I ask is to be quite convinced of the reality of this thing. Then I'll go ahead to the best of my ability.''

Turning toward the work-bench, he opened the drawer and began pawing over the disorder to find a small screwdriver such as he would need in opening the long flat box.

''Convinced?'' queried Russell in a strange tone. ''How?''

''Well, just show me the scar of the operation, for one thing. Then let me listen to your cardiac sounds. If they turn out to be, as you claim, purely mechanical, I'll accept that evidence and go ahead. Isn't that fair?'' And, still looking for the screwdriver, he bent over the open drawer.

''Isn't that reasonable?'' repeated Ackroyd. But his question was never answered. For voices sounded all at once outside the laboratory. Then footsteps crunched the gravel.

Russell stood up suddenly, clutching at the box upon his breast. Ackroyd, sensing rather than getting vision of the man's quick rage and terror, whirled round just in time to see him whip an automatic revolver from his pocket.

Outside a trilling whistle sounded. Steps clumped on the broad wooden piazza.

Russell, livid and trembling with sudden passion, thrust his head forward. With bowed shoulders and disordered dress, revolver balanced in his hand, he crept with stealthy tread toward the door. The grotesque quality of his figure contrasted horribly with its bestial tigerish murderous alertness.

Horrified, Ackroyd stood inert. The very suddenness of the transformation numbed him for a second. At the table he remained, staring with wide eyes, his jaw gaping, not yet able to understand, but foreseeing violence.

Came a decisive voice: ''I guess he's in there, all right enough.''

Another answered: ''We'll have him in a minute, now. But be careful. Here, Bray, you keep back. Now, all right?''

But before the door swung open Russell whirled on Ackroyd as the wizard sprang.

''You hound!'' he shrieked, jerking the revolver to position. ''You did this! You warned those fiends! You're in this infernal conspiracy, too, to break my glass heart and destroy my soul ! But I won't die alone!'' The man's face was black with rage, and foam had gathered at the corners of his mouth.

''Die!'' he yelled. But as the revolver barked Ackroyd ducked and, swinging his chair aloft, hurled it full at Russell.

It struck him squarely on the breast and shoulder. His revolver spat again as he fell; the bullet shattered the vacuum-tube overhead. Glass jangled. The light faded. Darkness fell. Ackroyd flung himself upon the man.

In burst the door, and by the glare of day through the opening the rescuers saw Ackroyd slowly getting up, with a dazed half-frightened air. Puzzled for a moment, they held back.

''What's—what's up?'' cried a voice. Ackroyd heard the snick of a revolver hammer.

''Wait!'' he panted. He found and pressed a button. Instantly a flood of yellow light inundated the laboratory from the reserve incandescents.

By this light they saw Russell lying, distorted, motionless, upon the floor. His eyes were open and staring—the hideous eyes of a man who has died in the grip of stark, mad terror.

''He—did he tell you—'' began one of the men. They wore blue uniforms and caps. ''Tell you he had a glass heart? Want you to repair it for him?''

Ackroyd did not answer. He merely snatched up the big sheet he used to cover his models with and spread it over the corpse.

''Come, get busy!'' he commanded. ''Take him out. This is no morgue. I'm busy. Too busy for any questions until

the inquest. Then you'll find me on hand to make an accounting for everything he said and did and gave me. Now, out you all go!"

Thus he dismissed them. Ten minutes later, with the old cob once more cheerfully erupting, he got back to his interrupted calculation, unmindful of the baffled reporters.

IV.

In the smoke-room our little group sat silent for a moment as Dr. Carmichael finished. Then Harrison spoke:

"Just an escaped lunatic? With religious mania, too?"

Hardly that. If so, extremely high grade. A man of his education, able to write and print a German paper like that just to substantiate his own hallucination, can hardly be classed as a mere lunatic. Rather call it a case of acute monomania. Perfectly sane in every other respect. Perfectly hopeless in *that* respect. So firmly convinced of it, in fact, that the shock of the chair against his apparatus dropped him stone-dead. Mind over matter? Well, rather!"

Another pause.

Then, in a satirical tone, up spoke Maynard, my travelling companion and cabin-mate.

"Well," judged he, "it was no more than he deserved for being a plain, infernal fool. Why, if he'd known anything about the subject of glass hearts, or artificial hearts of any kind, for that matter, he'd have been aware that there's only one *bona fide* case on record of such a thing actually working. So he stood, a self-convicted faker!"

"One—one case?" hesitated the bewildered doctor.

"Only one. But it's got nothing to do with all that rot about the soul residing in it and so on. Furthermore, it's not all glass, but partly glass and partly aluminium. And it's operated, not by simple magnetism, but—"

"How do you know such a lot of things that aren't so?" snapped the doctor.

Maynard's face grew hard and his eyes narrowed.

"Why oughtn't a man to know about his own heart?" he replied at length.

A dense stillness enveloped our group. Then the doctor coughed nervously, got up, and with a banal word of excuse withdrew down the stairway to the bar below. Harrison also departed. The gale whipped into the room as he shoved out to the heaving deck. Behind him the door banged.

I found myself alone with Maynard.

"The fools!" he laughed. Then he suddenly grew serious, with a strange, eager look upon his face.

He drew out pencil and notebook.

"See here!" he whispered, as his nervous fingers began with rapid strokes to form a diagram. "*My* heart is like this—see? I've never explained it yet to a living soul, but—this conversation to-night has decided me. If I should die the mystery would be lost. I make you my confidant. But remember, if you so much as lisp a syllable of this while I still live, I'll shoot you like a dog."

Then he laughed again, a high-pitched, cackling laugh in which lay no merriment. And while with sudden dread I watched, he began expounding to me, his chosen victim, the secret of the only successful artificial heart now operating in the world.

True books have been written in all ages by their greatest men; by great leaders, great statesmen, and great thinkers. These are all at your choice; and life is short. Will you jostle with the common crowd, for entree here, and audience there, when all the while this eternal court is open to you, with its society as the world, multitudinous as its days, the chosen and the mighty, of every place and time?—*Ruskin.*

Believe with all your heart that you will do what you were made to do. Never for an instant harbour a doubt of it. Drive it out of your mind if it seeks entrance. Entertain only the friendly thoughts or ideals of the thing you are determined to achieve. Reject all thought enemies, all discouraging moods—everything which would even suggest failure or unhappiness.

How a Debt Was Repaid

I FEAR I am a soft-hearted man. When people ask me to lend them money, I always do so. While my sterner nature is endeavouring to concoct some excuse, my hand goes into my pocket, and out the money comes. I have never yet been able to discover a good reason for not lending money, and I have tried constantly.

This will explain to you why I lent Brown, without question, the two pounds he asked me for the other day. Well, I did just say, "You really want the money?" But he replied that he really did, so that ended the matter. I gave him the two pounds, and he went away, saying it must be wonderful to be like me, and that I would get my reward in Heaven.

"Before, I hope," I said, with faint humour.

But he did not see my point. People you lend money to are not quick.

It was rather unfortunate, because I was a bit short myself, and there were one or two little things I wanted to buy. I mentioned this to my wife, whereupon she observed:—

"Well, why don't you sell that old grey suit of yours hanging in the cupboard? You always say you hate it, and you're never likely to wear it again."

She spoke as though it was surprising I had not thought of selling my old grey suit myself. Women are wonderfully practical. The idea had never occurred to me. I had never sold anything. I thought about it all the morning, and even went up to look at it once. It really wasn't a bad suit at all. I had felt very well dressed the first time I had worn it, and had obtained good attention in shops. I admit I began to feel a little sentimental about it. Perhaps I was not quite so hard up, after all.

Over lunch my wife said:—

"Have you thought any more about your old grey suit?"

"Oh, yes," I said. ..It's quite a good idea, quite a good idea."

"Well, I'd sell it," she replied.

Before lunch I had felt a trifle ashamed at the idea of selling a suit myself. Now I began to realise that I should lose caste if I did not. So, after a quiet cigarette, I went up again to have another look at it, took it out, and did it up in five small pieces of brown paper. We never have one large piece.

There is a small shop about ten minutes away where they buy anything and everything from anyone anywhere. A rather depressed-looking woman usually stands outside, waiting, I suppose, for anyone with anything, and I decided that I would sell my suit to her. There was a bit of a wind blowing, and before I had completed half the journey four of the small pieces of brown paper had blown away. This left only one round one of the trouser-legs, so I thought the best thing to do was to discard it, and to pretend that I was taking the suit to be cleaned and pressed without any snobbery about it.

The depressed-looking woman was standing outside her shop as usual when I arrived, and she didn't move when I stopped. I suppose she had seen me pass so often without stopping that she could not realise we were ever destined to meet, so to speak, in a business sense. I had never realised this myself. Anyway, she stared at me as though I wasn't there, and as, of course, I was there, I found it a bit awkward.

"I'm somebody with something," I said.

"Eh?" she replied, sharply.

I had thought a little humour might ease the situation for both of us, and I felt annoyed that she should take it like this.

"You say on your sign that you welcome anybody with anything," I explained, with some spirit, "and so I said I was somebody with something."

She looked at me hard, and then went into the shop.

"Jim!" I heard her call.

I followed her in. After all, if we were going to have this out it would be better to do so inside the shop than on the pavement.

She called "Jim!" again, but Jim did not appear. This pleased me.

" 'E's hout," she said, turning to me in a resigned way. "Well, wot is it? A suit?"

We were making progress. Dash it all, she was only a woman.

"Yes, a suit," I answered. "It's like this. I bought this suit some time ago—well, not so very long ago—had it made for me, I mean——"

She interrupted me. Perhaps she was right.

"Want ter sell it," she asked, tersely.

"Yes," I replied.

A pang of anger overcame me as she passed her dirty fingers over the suit, and pinched it. I had been in it. It was not in it now, but I had been. I had punted in it on the river, had been photographed in it, and had got a rise in it. It was full of pleasant memories.

"Seventeen and six," she said.

I stared back at her in astonishment, while making up my mind.

"Ridiculous! Absurd!" I retorted. "It's worth two pounds!"

"Two pounds!" she said, and walked away as though she had a letter to write.

I believe if I had waited a few seconds longer she would have spoken first, but the silence became too much for me, and I had to break it.

"Have you noticed its condition?" I asked.

"Seventeen-and-six," she said.

"But it's just been cleaned."

"Oh, cleaned?"

"Yes. I've had it cleaned regularly."

"Rooins 'em!" she retorted.

"Look here," I said earnestly, "you can have the suit for thirty shillings."

"Pound," she said.

There was another silence. Suddenly she darted to a dark corner and produced another suit.

"Feel that!" she said. "Better material. Your's ain't in it." A beastly, coarse thing! It was an insult! "Fifteen bob, that's all I gave. But you can 'ave a pound."

"Then why do you favour me?" I cried, indignantly. "If my suit is inferior, why do you offer me a bigger price?"

"We likes ter get customers," she said. "You might sell me another."

"I do not think so," I murmured.

She was fingering my suit again.

"Ah!" she exclaimed, triumphantly. "Patch."

"Done by the Invisible Mending Company!" I retorted. "Who'd see it?"

"I seen it. And look 'ere, 'ole in pocket. Needs ter be mended. All costs money."

I began to feel disgraced. There was another patch as yet undetected. Time was important.

"I've an idea!" I exclaimed. "A guinea!"

"Not a penny more," she snapped.

Her fingers were nearing the second patch. I saw there was no hope.

"All right," I said. "I don't mind. I only just want to get rid of the thing."

It is rather curious that, although I had gone to her to get money, the worst moment of all was when she gave it to me. I confess I felt deeply humiliated. Stuffing the soiled pound note in my pocket, and patting my suit good-bye, I left the shop.

I went home feeling depressed. I can battle against most things, but I was disturbed by the thought that I would have to work out another route to the station in order to avoid passing that shop any more.

"I've sold my suit," I told my wife. "I got a pound for it. Beat her up from seventeen shillings and sixpence."

She thought I ought to have got more, but was kind.

"I hope you felt in all the pockets first," she said.

Felt in all the pockets? Suddenly my head swam. Anybody's head would have swum. The last time I had worn the suit I had slipped two pound notes through the hole in the pocket into the lining. Seizing my hat, I rushed back.

"Can't help that now," said the woman, affecting not to believe me. "Sold it to a gent two minutes after you went."

What was the use? I walked home again. I have an idea that I burst into tears, but cannot remember.

In the evening Brown called. He was wearing my grey suit. And he had come to repay the two pounds he borrowed from me in the morning.

THE BUCCANEERS OF THE SPANISH MAIN

DAYS OF ROMANCE AND ADVENTURE

By ALEC JEFFREY

"We were schooner-rigged and rakish, with a low and lissome hull.
And we flew the pretty colours of the cross-bones and the skull;
We'd a big black Jolly Roger flapping grimly at the fore,
And we sailed the Spanish waters in the happy days of yore."
—Masefield.

IN boyhood days many of us were accustomed to weave a romance around the life of the pirate, or, to give him his original title, the "bucanier." How we revelled in the tales of these free-living rovers, gathering in hoards of gold moidores and pieces of eight, jewels and silver and gold plate, destined for the most part to swell the coffers of various institutions in Spain!

But what are the true facts? Dispossess these gentry of the glamour woven about them by romance and fiction, and your average pirate who "sailed the Spanish waters in the happy days of yore" cuts a very poor figure. Indeed one can only be filled with a sense of horror and disgust when the true character of these sea wolves becomes known, and it is realised what a mob of bloodthirsty inhuman brutes they were—albeit their courage and tenacity of purpose was at times amazing. One cannot help wondering how they were tolerated so long before the heel of the law stamped them out as one would a nest of vipers.

Although hostilities, both authorized and unauthorized, had taken place on the Spanish Main as early as 1570 between the English and French on the one part and the Spaniards on the other, it was not until one, Pierre Le Grand, a native of Normandy in 1640, made his debut that buccaneering as a profession really became popular. Dampier, Drake and Hawkins, apart from many French navigators, had singed the King of Spain's beard to some purpose in the latter half of the sixteenth century, but it was not until nearly a century later when the hunters and planters of Hayti, Jamaica and Tortuga, had grown to considerable numbers that buccaneering under the cloak of privateering commissions commenced in sober earnest. Finding that the profession of hunting wild cattle and turning them into "boucan" (the Carib Indian name for meat dried over a slow fire, from which the terms "bucanier," or "buccaneer" as it is now spelt, was derived) grew tedious, Le Grand, having persuaded twenty-eight kindred bucaniers to join him, embarked in an open boat to ascertain, perhaps, if the sea would be more liberal to him than the land.

It was, for after many days, when their provisions and water were all but gone, they fell in with a large Spanish galleon, in fact, that of the Vice-Admiral of the Spanish fleet in those waters. The wind at the time appears to have been very light, for Le Grand and his merry men were enabled to wait until nightfall before attacking. That they were desperate men in desperate circumstances the historian makes quite clear when he tells us that "before it was begun they gave orders to the chirurgeon of the boat to bore a hole in the sides thereof, to the intent that their own vessel, sinking under them might be compelled to attack more rigorously." They attacked to some purpose, for although this galleon was heavily armed and manned by a thoroughly disciplined crew the surprise was too great, and very soon the handful of boucan hunters were in possession of the ship and the surviving Spaniards battened down beneath the hatches. Le Grand, it would seem, did not intend to make a life habit of piracy as so many of his compeers

Bush path at Stanwell Park, South Coast, N.S.W.

did. "Enough is as good as a feast" may have been his motto, for we are told "as soon as he had taken the magnificent prize he set sail for France, carrying with him all the riches he found in that huge vessel. There he continued without ever returning unto the ports of America."

The Island of Tortuga, from which Le Grand set forth, lies separated by a narrow strip of sea from the mainland of Hispaniola, known to-day as Hayti. Seemingly this exploit of Pierre le Grand had an inflammatory effect on the good people of Tortuga, for "they had no sooner understood this happy event and the rich prize those pirates obtained, but they resolved to follow their example."

From that day until many a long day after Tortuga became the headquarters of the buccaneers, now termed pirates, and they came and went unhindered, "the whole people of the island admiring their progress." Originally occupied by a mixture of French and English, the latter, after some years, gradually drifted away, eventually establishing their own headquarters in Port Royal, Jamaica, which, at that time (1655), held a small garrison of Cromwell's soldiers.

Under the piratical aegis Tortuga soon became the "commonplace refuge of all sorts of wickedness and the seminary, as it were, of all manner of Pyrats and Thieves."

It was to Tortuga that these heroes of the Jolly Roger would return with the fruits of their labour to enjoy the blessings of the land. The "fruits of their labour" I will try to show anon; the "blessings of the land" usually took the form of such wild and unbridled licentiousness and debauchery that even the most extreme Bolshevik in the palmiest days of the Russian revolution would hardly dare to emulate. The hoards which these human devils won at the point of the cutlass or pistol would in the course of a night or two find its way into the coffers of the tavern keepers and the scores of undesirables who swarmed to the island. On these occasions our gay and giddy pirate, when on a really good jag, so to speak, would quite commonly get rid of anything from 2,000 to 3,000 pieces of eight in a single night. As a piece of eight was valued in those days at about five shillings, and five shillings then was worth about thirty-five shillings to-day, it will be seen that the two professions which supplied the amusement for our bucanier could hardly complain of the parsimony of those good folk.

These bucaniers, in spite of the many ghastly acts they perpetrated, were not without a code of morals of their own. They also had working agreements, which have many things in common with our "Articles of War," which the curious may see framed and posted up on the lower deck of any of our warships of to-day.

A writer who sojourned for some time

amongst these people relates that "among themselves they are very civil and charitable to each other." No pirate was ever left to languish in poverty whilst there was another at hand better off. They shared everything with each other—their money, their clothes, their food, and, in a manner of speaking, were Socialists of no mean order. Once at sea, they did themselves very well on the "full and plenty" system. Two meals a day was the order, at which they ate and drank all they wanted. Their food was not very varied, consisting in the main of dried or salted beef, pork or turtle, washed down by copious draughts of rumbo, a drink concocted of equal parts of rum and water, with a dash of sugar thrown in.

Not infrequently they would provision themselves for a voyage by first paying a visit to the neighbouring mainland of Hispaniola. Here were estancias in plenty, where the Spaniards raised cattle and hogs. One of these estancias would be raided, the cattle and hogs driven down to the beach, slaughtered and preserved by the process of "boucanning" already referred to. Incidentally they would requisition all the flour, sugar, brandy, wine, tobacco, lemons or limes they could lay their hands on; in fact, after a visit from the pirates there was not a lot left to the estancia beyond the four walls, and not always those.

Whoever provided the ship or the stores and armament, etc., for one of these enterprises was usually allotted one-third of the total booty garnered; the remainder was disposed pro rata.

The captain was apportioned from three to six shares, the master's mate two to three shares, and minor officers two shares. The seamen got one share apiece, and the boys, if any, half a share. However, before any living member of the expedition received the "fruits of his labours" the dead were attended to, and their shares in the spoil, plus a sort of compassionate allowance, were deducted from the main total and set aside to be delivered unto the dead man's heirs or assignees.

They also had a sort of "Workmen's Compensation Act" for the benefit of the wounded, which ran as follows: For the loss of a right arm, 600 pieces of eight or 6 slaves; for the loss of a left arm, 500 pieces of eight or 5 slaves.; for the loss of a right leg, 500 pieces of eight or 5 slaves; for the loss of a left leg, 400 pieces of eight or 4 slaves; for the loss of an eye or finger, 100 pieces of eight or 1 slave.

And so, for the space of a century or more, this irregular and more often than not barbaric warfare continued, always, or nearly always, with the Spanish ships and Spanish possessions as their objective..

Whether we were at war with Spain or not never troubled either the English or French authorities in those waters—they found the bucaniers such very profitable folk that, far from attempting to suppress them, they obligingly granted them commissions as privateers. One of the two nations was usually fighting Spain, and whichever happened to be at peace borrowed commissions from the one that was not, and when, by some strange turn of the political machine, there came a time when both nations had buried the hatchet for a space, they sent home to Portugal, who had just unearthed her's, whereupon that nation very kindly granted commissions to both the French and the English, and the game went on as merrily as ever.

That many of these bucaniers were courageous and skilful men, full of resource, and never knowing the meaning of defeat, is beyond question. The individual exploits of some of the most famous of them may form the subject of a later article.

Carry yourself with a self-confident air, an air of self-assurance, and you will not only inspire others with a belief in your strength, but you will come to believe in it yourself.

When you envy another it is because you think he is superior. When you hold bitterness, malice against another, this is, in a way, paying homage to what you regard as superiority.

By D. G. SOUTAR

Championship Courses.

"WHICH is the best championship course in Australia"? How do Australian courses compare with those in other parts of the world"?

The rapid spread of the game during recent years has attracted players of every station in life, including many who have played other sports, and the average Australian is naturally of an inquisitive turn of mind. He likes to set up his standard against the world, and more often than not will declare that his is the best. Be that as it may, the championship courses in Australia—their newness considered—compare favourably with other championship courses. The oldest championship course in Australia—Sandringham—is not yet twenty-five years old, and is only in its swaddling clothes as far as British courses are concerned. Another point is that our courses out here are all made courses. They have been carved out of the bush or scrub lands, whereas the Home courses have been turf since the beginning of golfing time. That is a point that should not be lost sight of when comparisons are being made. Golf courses are not made in a day. It takes years and the tramping of many feet to consolidate the true golfing turf. With regard to the opening question of this article, it is generally admitted that Kensington is our premier championship course. Situated in a valley between sandy ridges, it appeals to the golfers. The white sandy ridges with bunkers dotted throughout the expanse of green turf creates a true golfing atmosphere. One feels that to do otherwise than play good golf would be sacrilege. Kensington, before its present state of excellence was reached, has passed through many stages. When the present ground was acquired the committee of that time offered a prize for the best laid out course, and, like a good committeee, promptly decided that the plans submitted were not good enough. From the plans submitted they decided upon a course of their own, and again, like a good

A LINE OF WELL-KNOWN GOLFER

Reading from left to right: G. Brown, A. H. Wright, A. Leone, M. P. Aronso

committee, made a mess of things. The course they laid out had no fewer than six blind holes, and it did not take long for them to discover that that was a mistake. Experience proved the best teacher, and the course was gradually licked into shape, until to-day it stands out as our best championship course. The beautiful easy undulations are typical of the best seaside country which is so suitable for golf. The course is kept in splendid order, and bad tees are practically unknown. The greens are large and not too flat, being undulating enough to make them interesting and putting a pleasure, instead of the nerve-racking experience it usually is. Being within easy reach of the city, a considerable amount of week-day golf is played, and it speaks well for those responsible that the course is always in good order.

Sandringham.

Of the other championship courses Sandringham would be classed after Kensington. The country over which the course is laid out is eminently suited for golf, being of a sandy nature and easily undulating. There is one drawback to the course, which is becoming more pronounced each year. The ground had been subdivided before being purchased by the club, and roads made which cut through the course at various points. This necessitates long walks between the green and succeeding tee, and might easily be the means of upsetting a player's chances in a hard-fought game. Apart from that phase, however, little fault can be found with the course. It is well laid out, and with the exception of the first two and last two holes—due to the roads already mentioned—could not be improved upon. The fairways are always in excellent order, the turf being firm, the grass short, and the ball sits up well on it. The long game at Sandringham is always a pleasure to a player who is in form, but there is another side to the story when things are not going right. Being cut out of the scrub, a badly directed shot can get into sore trouble, and many a score has been ruined thereby. The greens are the last word in golf greens, and a missed putt is the fault of the player. Their size makes approaching easy, and there are few instances where the player is compelled to play a difficult shot. There are a number of excellent two-shot holes, notably the fourth, eleventh and thirteenth. With a breeze blowing they provide a searching test, and are difficult fours. Sandringham is perhaps the hardest of all our championship courses. It is open to every breeze, and the penalty is severe when mistakes are made. On the other hand, in calm weather the course is an easy one, and some phenomenally low scores have been recorded under those conditions. That is, perhaps, the best recommendation that a golf course can have bestowed upon it. Every course is easy to the player who is playing well.

Seaton.

The course of the Adelaide Golf Club at Seaton is laid out over fine country, which in many respects reminds one of the classic courses of the Old Country. The huge sand bunkers and hills closely re-

IN ACTION ON MANLY LINKS

R. Hill, L. A. Minnett, J. A. Wilson, and A. Stirling Stevenson.

semble the waste lands over which they are laid out. It is some years since I had the pleasure of a game at Seaton, and the course must have improved with age. Full advantage has been taken of the natural features when laying out the course, and some of the holes are unique. For instance, there is only one "crater" hole in Australia, and its fame is known wherever golf is played. In its early stages the course at Seaton suffered severely from want of water, but that difficulty has been overcome by sinking bores. A full and constant supply of water is now assured, and the course has rapidly improved as a result. Not only the greens, but the fairways also, can be drenched when necessary, so that there is no excuse upon that score. In one respect the Adelaide Club is fortunate. The railway runs right through the course, with a platform at the clubhouse door, and the track has been availed of as a hazard at some of the holes.

Rose Bay.

The course of the Royal Sydney Club, at Rose Bay, has come in for a deal of criticism during the past season, but the flat ground at the disposal of the green committee is not the best upon which to lay out an attractive golf course. The first nine holes compare more than favourably with any other successive nine holes on any course in Australia, but once the turn has been reached the player experiences a different feeling altogether. It has been stated that the outward half of the course is too easy, and when scores of 32 are recorded that impression can easily be formed. Judged by the scores put up, one would almost endorse that statement, but let us examine the position more closely. Every course is easy to the player who is playing well, but, on the other hand, the run of the ground and the position of the hazards have an important bearing upon the point of low scoring. At Rose Bay a player who is playing well, and is familiar with the run of the ground, can put up a good score by taking full advantage of that knowledge. Most of the greens have a slight fall from the left, and most players know that it is easier to stop the ball in the vicinity of the hole by using the run of the ground than it is to do so by playing direct at the pin on a level green. That feature is most pronounced at Rose Bay when approaching the hole is compared during the outward and homeward halves of the course. That is why the outward half is the easier to score over. Again, it has to be admitted that a player who is off his game can strike more trouble and make more bad holes on the outward half. The position of the hazards are responsible for that. The assistance that a good shot receives creates greater trouble for the bad or indifferent shot. Another feature is having two difficult short holes on the outward half; a good tee shot leaves a probable two for the hole, but a bad one will strike severe trouble. The sixth hole is a case in point. It would be fairly safe to state that more twos are holed at that hole than any other short hole; but, again, more strokes have been dropped at that hole than any other short hole in Australia. A visit to the bunkers might mean any figure being chronicled, but, notwithstanding, it is probably the best short hole of any in the championship series.

INTENSIFIED TRAINING

The field for employment in business and industrial callings now demands more than ever before the thoroughly trained man. That is why students of La Salle Extension University and similar institutions are in demand to-day when staff increases or promotions are made. To everyone who wishes to know how this training may be obtained we suggest that no time be lost in getting in touch with La Salle Institute, at 115 Pitt Street, Sydney, who will provide all the information desired. Many business houses are making specialized study a condition of employment, at the same time assisting the student in the payment of the fees. The business houses of to-day which adopt this progressive and far-sighted policy will be the business leaders of the next few years.

ROYAL SYDNEY GOLF CLUB

THIRTY YEARS OF REMARKABLE PROGRESS

THE PAST AND PRESENT REVIEWED

THE Royal Sydney Golf Club came into being at a meeting held in Mr. Gerald Campbell's chambers on August 2, 1893. The meeting was presided over by Mr. Campbell, and it was decided to start the Sydney Golf Club. The original members elected at that meeting were Messrs. H. D. Acland, R. C. Allen, C. C. Bethune, F. J. Bethune, A. Bowman, G. R. Campbell, G. H. Devonshire, L. Dobbin, H. M. Hamilton, Dr. Huxtable, J. M. Harvey, I. Kent, W. H. Linsley, H. Pollock, E. M. Stephen, A. H. Tickle, E. W. Tickle, B. R. Wise, Dr. W. C. Wilkinson, and Captain Sinclair, R.N.

Mr. Kent was elected honorary treasurer and Mr. L. Dobbin honorary secretary.

The links were situated on the estate of Miss Edith Walker, at Yaralla, Concord. Miss Walker gave the club a tenure of the links, with the use of the lodge as a clubhouse. The first handicap match was held early in October, 1893, and was won by Mr. Herbert Allen from a large field of sixteen competitors. This number sounds small when compared with the crowded state of courses at the present day.

About June, 1894, the Sydney Golf Club decided to maintain a course of nine holes at Bondi North, and rooms were taken at Mrs. Ebsworth's cottage for the use of members.

The course was short, but very sporting, and fairly decent greens were almost immediately available. A groundsman was employed one day a week to improve the course. Much interest began to be taken in the game about this time, and the mem-

The top view shows the caddy house and the first tee. The bottom depicts a crowd of spectators can be seen the ocean baths.

The Governor-General, Lord Forster (on the left), watching Mr. Ross Gore doing a particularly good drive at Rose Bay.

bership increased from 34 to 74 during 1895.

During this year it was decided to admit ladies as associate members, with the right to play on all days except Saturdays and public holidays. Amongst the original members were Mrs. Nixon, Mrs. A. H. Tickle, Miss Darley, Miss M. B. Johnston, Miss L. A. Massie, Miss E. C. Walker, Miss Watson, and Miss B. Weston. Golf in Sydney at this time received great practical support from the Governor of New South Wales, Lord Hampden. His Excellency and most of his staff were enthusiastic golfers, and frequently visited the links. His daughters likewise assisted the ladies' side of the club, and helped in its rapid development. The Sydney Club was also fortunate in numbering amongst its members two fine and enthusiastic players, Mr. F. H. Campion and the Hon. G. Gathorne Hardy, and the forward march of the club really dates from that period. Those players gave the game the necessary impetus, and the history of the club since that date has been one of progress.

In June, 1896, the then president of the club, Mr. B. R. Wise, entertained the members and their friends on the Bondi links. A large marquee was pitched on the present site of the old Club House—across the road from the present fifth green—and over 300 guests attended what was described as one of the most enjoyable outdoor entertainments ever held in Sydney. The events arranged for the afternoon were a mixed doubles handicap and a driving competition, both of which were distinct novelties at that time. The mixed foursome was won by Mr. R. H. L. Innes and Mrs. Lassetter, and the driving competition by Mr. J. W. Allen with a drive of 181 yards on the full. Mr. Allen must have got well on to that drive to carry such a distance, the present-day rubber-core ball being unheard of then. At the end of July, 1896, the club decided to engage a professional, and James Scott came out from Scotland under engagement to the club. His style was good and particularly free, and his services were eagerly availed of by the members of the club. He was with the club for six years, until he was accidentally drowned while fishing off the rocks at Bondi. The Sydney Club, although its headquarters were at Bondi still kept up the links at Concord, and Miss Walker presented the "Concord Cup" for competition amongst members. The first competition held in August, 1896, resulted in a tie between Messrs. R. H. L. Innes and L. Dobbin, the latter winning the play off.

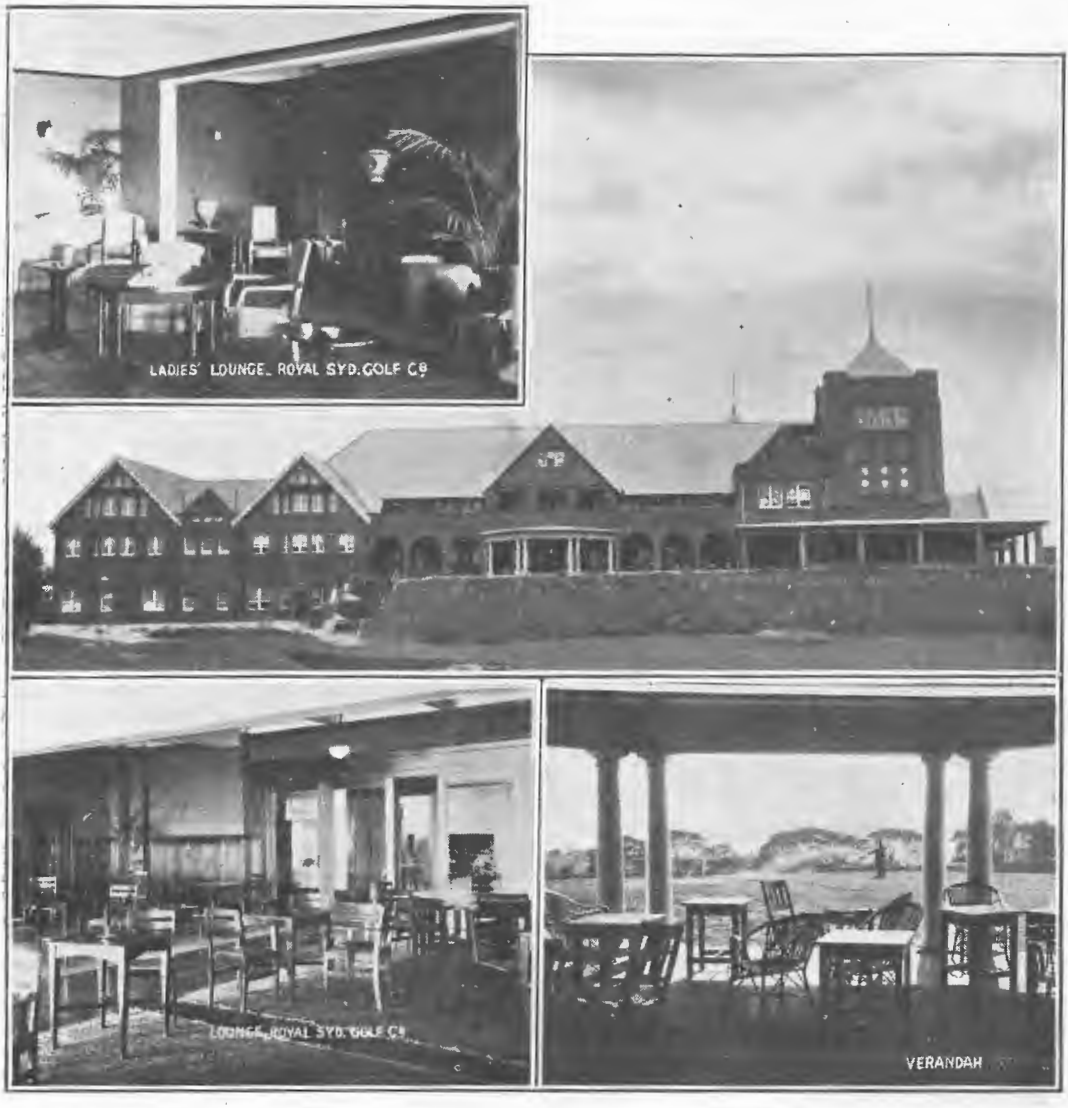
In October, 1896, the first competition for the ladies' championship of the Sydney Club was held, and Mrs. G. Robson was the first champion with the good score at that time of 125. Miss B. Weston and the Hon. Dorothy Brand were close seconds.

The first competition for the championship of the Sydney Club was held in September, 1895, and Mr. Kent secured the honour after some close and exciting contests.

In October, 1896, the Bondi course was extended to 18 holes, and the championship of the club was held, Mr. Campion easily defeating the holder, Mr. Kent.

The season of 1897 opened with an important move on the part of the club. It was decided to purchase land and erect a handsome and commodious clubhouse. This is the building now known as the Old Clubhouse. The annual report stated that there were "101 men and 34 ladies on the membership roll, and a substantial credit balance in the bank, though the club was under the expense of maintaining links at both Bondi and Concord."

In August, 1897, a team of seven ladies from the Royal Melbourne Golf Club visited Sydney and defeated the Sydney Golf Club's team by 23 holes. Many of the



The top picture shows the interior of the ladies' lounge. The handsome building in the centre is the Clubhouse, while the two bottom views show the loungeroom and the verandah.

Sydney ladies were comparatively new at the game, and no match for their wise, experienced opponents. Ladies' golf in Sydney, however, began to improve rapidly from this date as a result of seeing the crack Melbourne players.

On August 28, 1897, Lord Hampden opened the new clubhouse of the Sydney Golf Club, in the presence of a large gathering of members and friends, including the president, Mr. B. R. Wise, Admiral Bridge and many other notables, and it was then announced that Her Majesty Queen Victoria had been pleased to permit the club to attach the title "Royal" to its name. A match was to have been played between Scott, the local professional, and Taylor, the professional from the Royal Melbourne Golf Club, but Scott injured his hand just before the match, so an exhibition game was played by Taylor and Mr. Hugh Macneil for the benefit of the visitors. A driving competition on the same day resulted in a victory for Mr. H. M. Hamilton, with Mr. Milner Stephen second.

Mr. Ross Gore totalling up after a good round.

The "Concord Cup," played for at Concord about this time, resulted in a tie between Mr. R. H. L. Innes and Mr. Alex. Orr. They tied a second and again a third time in the play-off, but finally Mr. Innes had to waive the match owing to ill-health, and Mr. Orr became the holder of the trophy.

In September the Royal Sydney Golf Club opened up negotiations with the Royal Melbourne Golf Club regarding a change of venue for the Australian Amateur Championship, which had hitherto always been held in Melbourne. Previous to this date, however, many letters had passed between Mr. R. A. Balfour-Melville, of the Royal Melbourne Golf Club, and Mr. Leonard Dobbin, of the Royal Sydney Golf Club on the same subject, and it had been practically arranged that the request of the latter would be favourably received.

In May, 1898, Mr. Leonard Dobbin retired from the position of honorary secretary of the club, which he had held since its inception. His last act as secretary was to negotiate for the formation of the Australian Golf Union, the agreement for which was signed about this time.

In May, 1899, the first match for the Championship of Australia, under the auspices of the newly formed Australian Golf Union, resulted in a win for Mr. C. E. S. Gillies, of Auckland, New Zealand, with Mr. H. A. Howden second. Both these players have since holed their last putt, and "crossed that bourne from which no traveller shall return"; but they played an important part in the game in their respective spheres. They were outstanding players of their time. They were head and shoulders above their contemporaries, their scores in the championship being Gillies 314, Howden 325, the nearest New South Wales player being Mr. Hugh Macneil with 362. The Royal Sydney Golf Club was now concentrating all its energies and funds to the development of the links at Bondi, and the links at Concord were taken over by the Concord Club, which was formed about this time.

In July, 1899, the club suffered a serious loss in the death of Mr. Kent, who had been hon. treasurer since the inception of the club. A great athlete, he had a sound knowledge of golf, and his assistance to the beginners in the early days of the club was invaluable. He was a great-hearted and unassuming man, who will always be remembered by his friends with feelings of affectionate admiration. His memory is perpetuated in the name "Kent Road" of the approach to the present palatial clubhouse at Rose Bay.

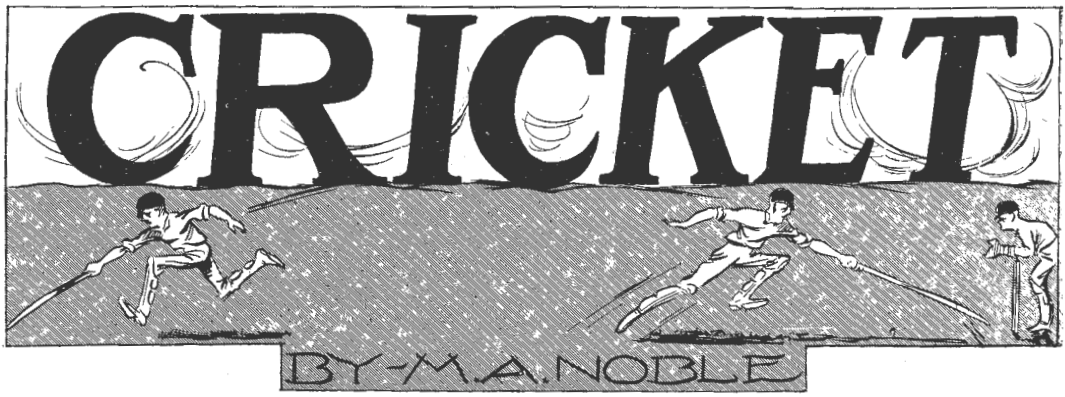
In this year a new star appeared on the golfing horizon. Mr. E. P. Simpson, the present president and captain of the Royal Sydney Golf Club, distinguished himself at the game by winning the championship of both the Royal Sydney and the Australian Golf Clubs.

From 1899 onwards the progress of the club was rapid. The links at Bondi, always on the short side, were far too small to allow of playing in comfort, and new ground had to be sought out. A company was formed, and acquired the land between the Old South Head Road and Rose Bay. Most of it was in use as Chinamen's gardens, so that it was an easy matter to get the ground well grassed and fit for play. Two courses were laid out, 18 and nine holes, and a large residential clubhouse built at the Rose Bay end of the new course. This new course was opened in 1904, and the championships of Australia were played over the links in 1906, the winner of the open being the club pro-

fessional, Carnegie Clark, and, of the amateur Mr. A. E. Gill, of Queensland.

In 1907 Mr. Ross Gore, who had been hon. secretary in 1904, and previously hon. secretary of the Royal Melbourne Club, was appointed secretary. In response to a demand from the growing membership, several lawn tennis courts were constructed, and with the great revival of tennis consequent on Australia's success in the Davis Cup matches it was found necessary to increase the number of courts, until at the present day there are 26 fine grass courts available for play. These are kept open all the year round. A croquet lawn is also provided for the devotees of that game. In 1919 it was obvious that the clubhouse accommodation would have to be increased, and in February, 1920, a contract was let for extensive additions in brick. The foundations for these additions were in and the work progressing when, in April, 1920, a disastrous fire broke out in the old portion of the clubhouse, which was of wood. A high wind was blowing at the time, and in about an hour and a half the building was practically burned to the ground. The committee immediately got to work and instructed the club architect, Mr. M. B. Halligan to design a new building. When this design was completed it was found that the foundations already in would have to be abandoned and regarded as a total loss. Mr. Halligan's design was accepted, and the new building has just been completed and furnished at a cost of about £87,000, raised on debentures taken up by members of the club, who now number close on 2,000. The committee, under the able presidency of Mr. E. P. Simpson, felt that a building worthy of the beautiful setting on the shores of Sydney Harbour should be erected. This they believe they have accomplished, and their members are now in occupation of a club-house replete with every convenience, and which should provide ample accommodation for many years. There are two golf courses—one of 18 holes and one of 9. Both courses have recently been remodelled, and the open and amateur championship of Australia were played in September, 1922, on the new 18-hole course, which is now 6,405 yards in length, and provides a severe test of golf. The open championship was won by C. Campbell, professional, of the Leura Club, who graduated from the workshop of Carnegie Clark, professional, at Rose Bay; and the amateur championship by Mr. Ivo Whitton, a member of the Royal Sydney Club, who learned his golf in Victoria. Mr. Whitton won the open championship of Australia at Sandringham before the war. The club provides employment for a ground and house staff of about 54 employees, and has become a sporting and social institution now almost indispensable to the life of Sydney.

The Forster Cup, presented to the Australian Golf Union by His Excellency Lord Forster for the Amateur Championship of Australia. It is at present held by Ivo Whitton.



Learning to Bat.

IN writing an article on "How to Bat" it is quite obvious to anyone that it is impossible to impart information by that means as well or effectively as can be done by practical illustration at the practice nets or on the field of play. But, as I cannot hope to give demonstrations under those conditions, I must endeavour to write these hints so lucidly and in such simple form that they will be understood, and be of some service to those who desire to put them into practice. To me it is a most difficult task. I am somewhat anxious as to the result, and can only hope that success will attend the effort, for my one and only object is to impart knowledge, which has come to me after years of hard work, regular practice and experience gained in the highest grade of cricket.

What Not To Do.

When I was in my teens I went out to the nets and saw an international batsman watching a young, promising player practicing, and, noticing that he was making a particular stroke in the wrong way, said to him in a very kindly and friendly way, "Move your feet across and face the ball; you will find it much easier and more effective to make that stroke." The young player took no notice, and, thinking he was not heard, the international repeated the advice, with the same result. A third time he spoke, but never by so much as a word or a glance did the young player indicate that he had heard. The international walked away sad and crestfallen. That young man never realised the expectation his admirers had of him; neither did he achieve his own cricketing ambition. That little incident, small in its way, yet big in effect, had a lastng influence upon me. I could not help reflecting upon the idiotic attitude of that young man and his unbounded conceit. All the time there was another youngster there who was bursting to ask for some instruction, but didn't have the pluck to do so. Some few years later that youngster did very gratefully receive some very valuable hints from the same international. Of course, you will have guessed that youngster Number Two was myself.

Since then it has been my great desire to help the young players, and amongst the many hundreds of times that I have endeavoured to do so only one player of them all turned a deaf ear. Neither did he succeed to even mediocrity. This incident is mentioned only as a warning at the outset that these notes are written expressly for those who do not know, and want to; not for those who think they know and don't, and won't be told.

The First Essential Point.

To become a good batsman you must attend to your health. It is essential that your body be kept clean. There is a saying that baths weaken you; it is used mostly by people who rarely have one. I know hundreds of clean young men who are very strong and active and healthy. Eat food that agrees with you; as soon as you discover something that you are particularly partial to disagrees with you stop eating it—it interferes with your digestion and your eyesight suffers. If your eyes are not in good condition it naturally fol-

lows that you will not see the ball properly, therefore, your timing is faulty and your batting suffers. Get plenty of sleep, particularly the night before the match is played, and as most of our games are played on Saturdays go to bed early on Friday night. If the game is continued for three or four days go to bed early every night until it is finished. It is not a good thing to make a practice of smoking before you have to bat, though some very famous players do it without any apparent effect. It is, however, hard to say whether the man who smokes would have played that extra good ball which bowled him or he would have back-cut that short one on the off to the fence, instead of mistiming it and being caught behind the wicket or in the slips if he had not laid that cigarette or pipe down just prior to leaving the pavilion. In relation to this phase of conduct, a rather amusing incident occurred only this season to myself. I went to Birchgrove to play against Balmain, and arrived on the ground smoking. Immediately a small boy said: "Look at Noble smoking, and yet he tells us not to smoke when we have to play cricket." It only shows how careful one has to be in tendering advice to others. Perhaps my young friend will forgive me a little pleasant relaxation now after years of devoted effort in application of a principle which served me and the team for which I played well.

Abstain from Stimulants.

Again, it is not good to take alcohol before batting; yet I am not a teetotaller. The taking of alcohol is, I believe, a mistake before going in to bat. If a man drinks moderately and has one after a long innings it helps to reduce the weariness, and, being a stimulant, though of only a temporary character, it relieves the tiredness which surely comes after great exertion. We know of cases where a batsman has been successfully fortified by alcohol prior to facing the music, particularly when the game seemed hopeless, but it is fortunately rarely necessary, and is not a practice worthy of emulation. One is naturally reluctant to speak personally on a matter of this kind, but I may be forgiven for just telling you that I never, under any circumstances, while playing first-class cricket had a drink before going in to bat, or just prior to or in any of the preceding hours of the day. With regard to bowlers, a little stimulant undoubtedly helps a player during a long and arduous day's work. I said a *little*, and I *mean* just that. It does not, however, seem vitally necessary for teetotallers. It is not because he likes it so enormously or that he cannot do without it that a cricketer takes the cup that cheers; it is usually because of the good fellowship and the jovial atmosphere it seems to create. However, it is far wiser to have your joviality in restricted quantities after dinner at night-time. It is also my opinion that eating too much and drinking a lot of soft drinks prior to playing an innings are nearly, if not quite, as injurious as taking alcohol or smoking. These things are a needless handicap, and prevent you from producing that 100 per cent. efficiency which is so desirable and necessary.

Look Smart on the Field.

When you go out to the field of play you should try and have your clothes, from your cap to your boots, look neat and clean, and be sure and keep your sleeves rolled up. You do not need an expensive outfit. Canvas boots can be made to look just as white as buckskin, and they are really very serviceable. Do not wear shoes; they are no support to the ankles, and give very little protection to the feet in case the bowler lobs a fast one on to your pet corn, or you play one on to your instep. A fairly wide welt is an added protection. Thick soles are absolutely essential, and, together with thick socks, are a great protection, particularly for bowlers. Another virtue they possess is that long nails can be hammered into them, leaving about a third of the length exposed. There should be thirteen nails in each boot, eight in the sole and five in heel. They should be placed round the sole about three-quarters of an inch from the edge, and not in the centre. A cricketer cannot afford to be slipping about; many a match has been lost because of a player's negligence in this respect. Wear side straps to your trousers, with good strong buckles; they strap up tightly with no inconvenience. Illustrative of this necessity, I was once, and only once, asked to act as wicket-keeper in an interstate match against Vic-

toria at Melbourne, and lost a chance of stumping the late Harry Trott, who had jumped out to a slow ball and missed it, because I was improperly buckled. My trousers, being rather long, gradually worked under the heels, and as I attempted to spring forward from short stop my feet went from under me, and Trott regained the crease while I foundered majestically on the grass. It is a wise precaution to wear at least one batting glove, particularly for the bowlers. Left-hand bowlers should always wear a glove on the left hand and right-hand bowlers one on the right hand. You are always taking a chance by not doing so—a chance of injury to yourself. On bad wickets it is advisable to wear a batting glove on each hand. Never by any chance go into bat with only one legging on; it not only looks bad, but it is dangerous. If a fast ball hits you properly inside the knee you won't play cricket for some weeks, perhaps not for twelve months, so why risk it. Cricket pads should be made with an extra cane on the outside of the left leg and on the inside of the right leg, and *vice versa* for a left-handed batsman. The buckles of the pads should be placed on the inside of the left leg and on the right side of the right leg. The blow is much more severe if the ball "crushes" the buckle against the leg, and in these positions they are less likely to be hit.

Selecting a Bat.

The most important part of the batsman's equipment is, of course, the bat. In selecting same the weight which is usually considered best is anything between 2 lbs. 5 ounces to 2 lbs. 6½ ounces, but this is only a general rule. Some players like a heavier or a lighter bat, as the case may be. If you are not a tall man select a bat that is a little shorter than full length. There are plenty of them made with a shorter handle, and very good ones, too. Some of our leading players use them.

A most important point in selecting a bat is the grain. It should be as straight as possible, and free from knots. When oiling a bat oil only the sides and front of the blade below the cane, but do not oil the back. Set to work to harden the face of the bat by throwing a ball up and hitting it into the side of the net. Never use a new ball on a new bat; it is liable to smash the blade.

Breaking In the Bat.

Break it in thoroughly with an old ball at practice before using it in a match. Bindings are detrimental to any bat; they cut the edge and weaken it considerably. If it is not broken too badly the best method of mending it is by stretching one or two pieces of adhesive tape, one or two inches in width from the back of the blade across the face and seal down on the back again; it is quite remarkable how long a slightly broken bat will last when this temporary expedient is used. This method, unlike binding the bat with string, does not interfere with its balance, and as extra weight often means the difference between making a successful stroke and only just snicking it, with a very big chance of being caught behind the wicket, it is very important and well worth a trial. Be sure to select a bat that is not too heavy to lift easily. Sometimes a heavy bat will "come up," as the saying is, far easier than one much lighter, the reason being that it is properly balanced. If, after having bought your bat you find it a little too heavy buy a rubber cover for the handle; it very often restores the balance. If you already have one on the handle put another over it. Rubber covers should be glued to the handle to prevent slipping, or the bat is liable to turn in the hand when making a stroke. Have the rubber fitted to the handle about half an inch short of the top; this prevents the rubber pulling over the top. If it is glued on right to the top cut half an inch off with a penknife. Sometimes in making a stroke the top hand catches the end of the rubbers, and if it is not glued firmly to the handle it is pulled away and comes back into place with a click. It is quite possible if the umpire hears it you may be given out caught behind the wicket, even though you do not hit the ball. For the same reason you should not use a bat with a loose cane in the handle. Some players never use a rubber; two notable examples were "Trumper" and "Duff." They would scrape the string with a knife or piece of glass to roughen it, and rub resin over the surface, which is a very good and effective

(*Continued on Page* 796.)

THE WOMAN'S CORNER

PALE HANDS, PINK TIPPED.

ONE of a woman's greatest attractions is a shapely and well-cared-for hand. In these days of do-your own-work, when women's hands are being constantly plunged into wash-tub and sink, it behoves them to take a little extra trouble with them after the household work is done for the day.

Unless cared for, there is no part of the body which ages so quickly as the hands; but spare them a little daily thought, and there is no real reason why they should not retain their symmetry and softness. A superfatted soap should be used in bath and bedroom; the strong-scented varieties should be avoided by women who work and whose hands are thus apt to get chapped. Many women owe their soft skins to pure castile. The used half of a lemon rubbed over the hands at night will make them satiny and white, and remove the smarting red of sunburn. If the hands are roughened rub in some vegetable grease, but care should be taken not to fly to an expensive cold cream for this; what is suitable for the skin of the face may be nothing more than an irritant for dried-up hands. Almond oil is excellent. Glycerine is only suitable for some skins; it has a tendency to bring out a rash on others.

It will repay a woman who has much sewing to do to wear a bone or rubber shield on the first finger of her left hand. In this way unsightly pricks of the needle on the skin are avoided.

A well-shaped hand is seldom improved by the wearing of bracelets. They break the symmetry of the curve where the hand joins the arm, a curve which can be as perfect in its way as the lines of a beautiful neck. The old masters specialized in the art of painting hands, and a close study of their pictures will show that our great-great-grandmothers were wiser in their generation that we are.

HINTS ON HOME MANICURE.

As wedding or birthday gifts, many women are presented with costly manicure sets, which look decorative enough on the dressing-table, but when the contents come to be put to use they are of doubtful value. These cases often contain implements of fine torture that no sensible woman would use on her hands. For instance, a steel file should never be used for cleaning under the nails where the flesh is sensitive. Cuticle scissors do more to ruin the hands than anything. The well-groomed nails will never be those that find themselves under the nip of scissors.

For home manicure a few special articles, bought separately for preference, for then they can be chosen for their serviceableness and not their outward appearance, are all that is necessary. First, procure the very best file within your means. The ideal file is a thin strip of steel, not less than six inches long. Both ends are rounded, and it has no handle of any sort. A packet of emery boards, an orange stick —one shaped like a horse's hoof at one end, and covered with rubber and the fine end scooped to a point (but not shaped nor sharpened like a pencil) is the best; a little peroxide or an equivalent fluid for removing stains from the nails, and a tube of lanoline. This is the whole outfit.

Taking the broader end of the file between the second and third fingers, with the thumb pressing it lightly back against the first finger to impart a certain springiness, file the nail to the shape desired, always remembering to file from the corners towards the centre. This should be done before the hands are soaked to soften the cuticle. When filed, the emery

board may be passed lightly over the edges in an outward and downward direction. Only hang-nails should be removed by scissors; cutting makes the nails brittle and liable to split. The cuticle should never be cut; each time it is, it thickens in the next growth, and will eventually become a coarse ridge round the semi-circle of the nail. Lanoline rubbed in well at night will soften and heal the broken parts. After filing the nails may be soaked in warm, soapy water, dried and rubbed with lanoline, and the horseshoe end of the orange stick used to push back the loose skin. Peroxide may be used with advantage for this purpose, too; also, to clean under the nails, but the greatest care should be taken not to break into the natural line where the nail springs away from the flesh. Embedded dirt must be removed with a nail brush or allowed to grow out, but never dug out with a sharpened implement. Damage is quickly done in this way that takes months to rectify; often the perfect line is destroyed for ever.

We should all study the individuality of our own hands. For square or particularly rounded finger tops filbert-shaped nails are only ridiculous, and those who work much with their hands will find they jag or split on the slightest provocation. Follow the outline of the finger, and the best results will be obtained.

ROMANCE IS NOT DEAD.

The sapphire mists of the Blue Mountains have crept up every evening for the last few months to the threshold of a very real home of romance. On the heights above the Megalong Valley a little house has been built, lath by lath, by the eager hands of a young woodsman, who, on the twelfth of last month, married a Wollongong lassie and brought her to the miniature palace that he, and he alone, had fashioned for her. The son of a builder, he had some primary skill to start with; love and the instincts of a real home-maker did the rest. Tucked away in the gum bush, the little house is just an ordinary dwelling to the eye of the passer-by, but inside it is a woman's earthly paradise. There are cupboards built into the walls in kitchen and living-room, and a roomy wardrobe with a section for dresses, another for hats and one for shoes in the bedroom. The two front rooms have large bow windows, with box window seats, all upholstered by loving hands. The fenders are of local wood, polished to gleaming point, and every room is lined to the picture rail with three-ply wood, hand-stained to mahogany colour or cheerful green. Grilles between the living-room and the inner house porch, and the breakfast-room and the kitchen give a sense of wide spaces; and the snow white bathroom, with its pure white bath, is fit for a princess. All this has been the single-handed work spread over three months.

And all around the bush steals up to the fences, brushing them with fairy fingers of flowering ti-tree, of red-veined eucalypt. tus, and mountain devils peer out of their shrubberies, curious to see the lovers who have come to live in their midst.

Who says Romance is dead?

THE TALL WOMAN SCORES.

With the lengthening of skirts the tall woman regains her lost dignity. She had a horrible time when the vivandiere skirts were in vogue. For the tall woman has feet to match her height, and when she attempts to compress them into short-toed, snub-nosed shoes the result is hideous. Many of her type did attempt it in the hope of disguising long feet left unprotected in the cold light of day. If she has anything to say about it, skirts will never be skyed again. Here follow a few points for the tall woman to commit to memory:

Don't be kittenish if you are over five feet six.

Don't walk beside a short man in the street.

Don't sit on a low seat or stool. Squatting and "curling up" is not for you.

Don't wear zebra materials or vivid colourings.

Don't wear mushroom hats unless you want to look like a candle extinguisher. You were born to carry the picture hat.

Don't allow your voice to rise above a well modulated pitch. Remember you will be seen in a crowd, so don't hanker to be heard as well.

Don't dress your hair on top of your head.

Don't wear cheap corsets. They are the last economy you should practice.

MAY GIBBS AND THE GUM NUTS.

Just now, when our gum nut fairies have come to town in battalions, and Little Obelia and Ragged Blossom and Snuggle-pot and Cuddle-pie are swarming into hundreds of children's homes, and Father Christmas is struggling down the chimneys, laden with new editions, it is interesting to turn to the personality of the woman whose cunning brain evolved and invented the real Australian fairy—the sprite of the gum trees.

May Gibbs (Mrs. Ossoli Kelly) may be said to have been gifted with real inspiration when she thought of her gum-nut babies. She confesses that the conventional fairies in spangled frocks with silver stars in their hair never made any appeal to her, even as a tiny child. She was able to make her own fairyland out of the bush flowers and the twisted gums in the boronia-scented west, from whence she comes. She could always "see things" in the native scrub, and to-day the gum-nuts come tumbling into her mind so easily that she makes light of her own gift. Though a new book about the gum-nuts is on its way, it will not be ready for the market until well on into next year. Meantime, she is aiming at higher things, and has been of late devoting herself almost exclusively to portraiture. A true artist, she is not content to stand still or allow her work to fall into a rut, which its commercial value is inclined to encourage.

Intensely reserved and diffident of talking of her own efforts, May Gibbs has a fine appreciation of her fellow artists. She studied abroad for several years, but on each occasion was torn between the call of art and the call of home; each time home won. She has an infinite belief in the possibilities of Australia as a veritable gold mine, as yet almost untapped, of fresh ideas and fresh material for the artist. She believes that Australia and the bush has something to offer in the way of originality that no other country quite reaches. As an art centre it is only waiting to be discovered by those who have vision, and the pluck not to desert their vision.

From her home at Neutral Bay, overlooking the harbour, yet in a quiet backwater, she sees far. Behind the plumbago hedges and hidden in the salvia bushes of her garden Little Obelia and her brothers

Belles of Bygone Days

Letter from Miss Phyllida Evander, of London, to Miss Chloe of Devon.

August, 1765.

Sweet Chloe,—

Here is news indeed. To-morrow I attend a Fete Champetre at Ranelagh. There is much woe among the Belles, for we are bidden attend without powder and with flowing locks. 'Tis to give a pleasant air of nature, say

the authorities. I sweare many a beauty looks mighty foolish in her own locks. My own hair has suffered not at all under the perruques we wear daily, for Betty washes it every two weeks with Stallax, which makes it wondrous lustrous, and I vow thy Phyllida will not look unseemly with her flowing tresses. I am to appear as a Sicilian Vine Dresser, and wear a sweet cream-colour'd Lutestring with festoons of grapes. Lud! How I long for to-morrow!

Thy Phyllida.

(Note.—The modern woman will doubtless be interested to know that Stallax is to this day much in favour as a Shampoo, and is obtainable from the present-day Chemist.)

and sisters are born to-day, almost with the wave of a pencil, as with the brush of a wand. Born in a night from her intimate knowledge of the bush, May Gibbs's family are produced by a sort of sleight of hand. She herself makes light of them. "Some day I hope to do bigger things," she says.

But she has given us the Australian fairy, and thousands of us will ask no greater boon of her.

HOW TO KEEP COOL.

By putting both hands into cold water up to the wrist joints almost as much heat may be lost from the body as is produced per hour by a man sitting at rest.

If the hands are exposed to the midday sun the temperature of the median vein rises several degrees.

Boy: "Go it, Suzanne!"

So, if you wish to be cool, keep your hands out of the sun, and dip them over the wrists in cool water when you get a chance.

PRINCESS MARY'S FLOWER.

The sweet pea, Princess Mary's favourite flower, has its association with Royalty, for it was described some time ago by an American authority as "queenly in all its habits."

It came from Sicily 200 years ago, but for 150 years very little attempt was made for its development, and there were only a few varieties. Even in 1880 little had been done, but in 1882 Henry Eckford began to give the world the results of his work, producing new colours and combinations of colours and improvement of size and symmetry without sacrificing fragrance.

SOME TOOTHSOME DELICACIES FOR THE HOLIDAYS.

PRUNE DELIGHT—

Will be appreciated by all. Steam half a cupful of medium-sized prunes until just tender. Cool, remove pits, and cut into small pieces. Pare and core three medium-sized apples, and cut into small cubes. Mix the prunes and apples, add some chopped walnut meats and seedless raisins. Mix together six tablespoonfuls of French dressing and three tablespoonfuls of currant jelly, and beat well. Then combine apples, prunes, walnuts, raisins with the dressing, and serve cupped in crisp lettuce leaves.

DELICIOUS SMALL CAKES—

Take equal weights of chopped apples, raisins, candied peel, currants and brown sugar. To every pound of this mixture add the juice and rind of one lemon and half a teaspoonful of mixed spice. Make into small cakes with flour and suet, but not too moist. Brush over with white of egg, bake on floured tin in a quick oven.

PINEAPPLE ROUNDS—

These are most attractive, and make a particularly nice dessert. Cut out rather large rounds of bread, spread with butter, and brown on each side in a frying pan. Keep very hot, and put on a hot serving plate. Just before serving lay a slice of

iced pineapple and a little of the juice on each, also a little red jelly and a candied cherry on each.

HOUSEHOLD HINTS.

STAINS ON TABLECLOTHS.

Black ink.—Soak in milk for several hours, then rinse in clean water.

Red ink.—Soak in ammonia and water, then rinse.

Tea.—Wash in cold water, then pour boiling water through.

Coffee.—Stretch damaged part of cloth over a basin, then pour boiling water through.

Cocoa.—Wash in cold water, then pour boiling water through.

Oil.—Cover with lard, leave for few minutes, then wash in cold water and soap.

ANTIQUITY OF THE UMBRELLA.

The origin of the umbrella dates far back into the time of the Ancients.

In "The Birds," a play written in 414 B.C., during the seige of Syracuse by Alcibiades and Nisias, in which the Athenians' fondness for litigation and their flighty character are ridiculed, Aristophanes reveals the true inventor of the "ombrella," or sunshade.

The inventor was none other than Prometheus, who has been since celebrated in verse by Shelley.

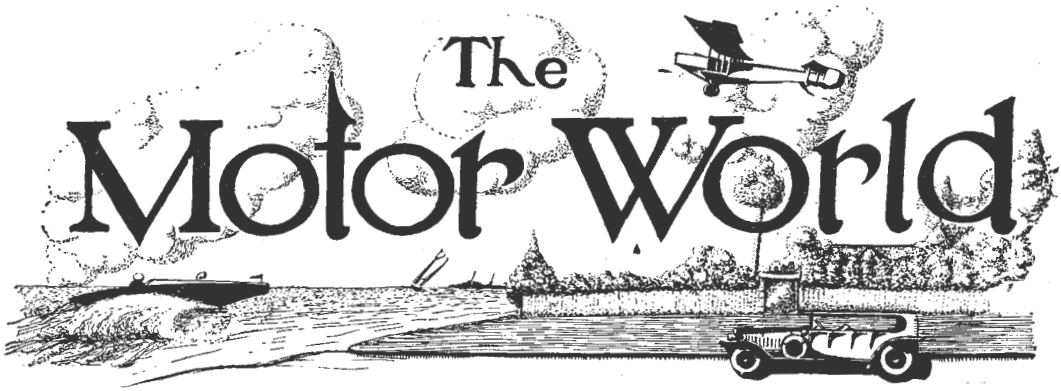
He invented the "ombrella" to conceal himself from Jupiter, his enemy, and he said of it:—

"I shall look like a canephore" basket bearer—one of the Athenian maidens selected to carry baskets of sacred utensils in the procession of Demeter, Bacchus and Athene.

NEWCASTLE BEACH

Photo: M. Dixon.

This view shows the beach promenade, and in the distance, in the extreme right-hand corner, can be seen the ocean baths.



By "SPARKING PLUG"

Advent of Motor Trams.

FROM time to time the motor world seems to tingle with fresh news of motoring development in means of transit, on sea, land, or in the air.

So many experiments have been successfully tried that one begins to wonder what the possibilities of motoring will be by the time the Christmas carols are bidding farewell to the parting year, say, of 1932.

The Railway Commissioners have already created a great impression in North Coast districts by testing the rail motor train there, and the indications are that more motor trains will be immediately constructed to take the place of the steam trams in Crouulla, Arncliffe, Bexley, Broken Hill and Maitland.

The motor trains are to all intents and purposes motor trams, the drivers of each having similar location and accommodation.

The idea of motor trams supplanting the electric cars used in Sydney and suburbs conjures up visions of many revolutionary changes within the next few years.

If electricity can be dispensed with ultimately, as far as the tramway service is concerned, it should be the means of eliminating considerable expenditure, and so enable the Commissioners to grant the overdue right of the travelling public by a reduction of fares.

Motor Body Work.

The body work of the handsome *S.C.A.T.* car, an excellent colour reproduction of which appeared on the front cover of the December issue of *Sea, Land & Air,* was carried out by the Miller Motor Body Co., of Sydney. An unfortunate typographical error caused the name Miller to be omitted.

The *S.C.A.T.* car now enjoys a reputation amongst Australian motorists to which its undeniably excellent all-round workmanship justly entitles it.

Bullocks Make Way for Motor Trucks.

Man's faithful friend—the horse—has long since had to make way for the all-conquering motor, but until recently nobody realised how quickly the new idea proposed to thrust in the background the patient and plodding team of bullocks always to be associated with the black and red soil plains of country districts.

One enterprising back-country timber-getter has procured a motor lorry to haul his timber, and he finds that his cost of haulage has been reduced to one-third of the cost of the bullock teams. He is also enabled to lift more timber and more promptly attend to the work he has in hand.

Only the fringe of motor possibilities in rural districts has been touched to date, although farmers, merchants and traders are rapidly beginning to realise that motor transmit means expedition and economy.

The high operating costs of horse-drawn vehicles and the small amount of work turned out in return has caused many firms to look about for ways and means of reducing expenditure, and thus reduce the cost of articles they manufacture. There

is no item connected with production, either primary or secondary products, which so affects the prices as that of transport.

To keep down transport costs and still give good service to customers is the problem confronting the business world of today. Transport is probably the oldest business in the world, and plays an important part in modern commerce, and is one of the biggest overhead expenses that have to be met. In many cases business men find that a large percentage of the profit they are entitled to is lost on transport. There is no particular reason why this should be the case if the transport problem is taken seriously, and if this is done it is possible to make it a profit-making factor in the business.

Mr. Boyd Edkins on North Coast.

Mr. Boyd Edkins, the well-known motorist, and managing director of Boyd Edkins, Ltd., unexpectedly had occasion to visit Lismore Show during November. At midday on the 28th he decided to leave that afternoon for Lismore. The show opened on Tuesday, and extended over Wednesday and Thursday. At 3 p.m. on Tuesday Mr. Edkins, accompanied by Mr. Webb, his chief mechanic, left the office in a 30,98 *Vauxhall*, and set out northward. An hour and three-quarters' travelling brought them to Wiseman's Ferry (61 miles). After half an hour for afternoon tea and another half an hour they absorbed waiting for and crossing the ferry, another 15 minutes for the M'Donald River ferry, arriving at St. Albans (71 miles) at 5.45, where a halt was made for the evening meal. Leaving St. Albans at 6.35, they again halted at Wollombi for 15 minutes whilst the storm passed over. At Singleton they remained whilst they telephoned Maitland to deliver a message for some people who were expected there that night with a new car, but had struck electrical trouble at Wollombi, and could not proceed without lights. This took up 10 minutes. They made Muswellbrook (170 miles) at 10.35, the total travelling time being 5hr. 55min. Next morning they left Muswellbrook at 5.15, reaching Tamworth at 8.10 for breakfast. In view of the fact that they had to open all the gates on the Goonoo Road, and that they experienced five minutes' delay at Ardgyle railway gates, their time (2hr. 55min.) was exceptionally good. Leaving Tamworth at 9.17, they reached Armidale (79 miles) at 11.30, and Tenterfield at 5.52 p.m. The following morning they left Tenterfield at 4 a.m., and made Lismore at breakfast-time, ready for the day's work.

The total distance covered was 601 miles. This performance convincingly proves the utility of the real thoroughbred machine. No ordinary car could be found which would do it with the same comfort during the trip. Arriving at Lismore, Mr. Edkins advises that he was as fresh as paint, and was looking forward to a good day at the show, and a game of billiards in the evening, provided he could find a table.

Petrol consumption averaged 20½ miles per gallon. They started away with a car shod on old tyres, but, with the exception of one puncture, had no further trouble.

Flying Down Mt. Hotham.

One of the competitors in the recent alpine test thought the end of the world was in sight coming down Mount Hotham. He says: "Descending on second gear, it was found impossible to hold the machine, as the brakes failed to act, and with a sheer drop of some thousands of feet on the one hand, and the car gaining momentum, something had to be done, and that quickly.

"Realising the position, I saw that I must change into first gear, and the problem was how to do so without slipping into neutral with the motor moving at about 25 m.p.h. Racing the engine until it approximated that speed on low gear the desired change was made by a superhuman effort, and the control of the car regained. It was the most thrilling experience I had had in 20 years of motoring, for it was a matter of life and death. So forcible had been the change that the gear lever was strained and twisted in the gate, and I could not change to a higher ratio until Bright was reached, and had to drive on low gear for more than 30 miles."

MOTORGRAMS.

Motorists generally have wonderful opportunities of extending their knowledge of the country. The main form taken by

land competitions, both for motor cars and motor cycles, being reliability trials, in which strictly moderate speed averages have to be adhered to under penalties for disregarding them, ensure that they will always have time to appreciate any scenic or historic gems along the route. The educational value of the motor vehicle in that way would be hard to over-estimate.

That the motor by no means robs its votaries of either their stamina or the adventurous spirit which brought our forbears to this country and has kept them pushing outwards through the length and breadth of wildest Australia ever since, was shown once more when 27 hardy young riders faced the starter in the ancient Sydney Bicycle and Motorcycle Club's 24 hours reliability trial on December 2 and 3. They were not the least dismayed by the fact that the two previous trials of the same duration were both characterized by battles of hundreds of miles with adverse weather, and resolved themselves into out-and-out tests of the survival of the fittest.

The discussion culminating in the disqualification, after enquiry, of the winner of the petrol test in the Victorian alpine trials emphasizes the unsatisfactory nature of these contests, both from a trade and a private owner's point of view, under the conditions usually imposed. Many of Sydney's leading exponents of automobile competition do not hesitate to characterize them as a farce, where unlimited coasting with dead engines is permitted. They point out that such is not driving under touring conditions at all. Taking full advantage of permission to shut off the engine and use your weight on every grade is certainly a weariness to the flesh for practical motoring purposes.

* * *

Talking of traffic "jams," Mr. Claude M'Intosh, recently returned from America, says that when driving into New York on a holiday he was compelled to take his place in a line of traffic 80 miles before reaching the city, and thereafter proceed strictly under control to the end of his

journey. Tom Ugly's Point and the Spit would seem very insignificant affairs after that experience.

* * *

On being chaffed for winning his own prize at the Motor Yacht Club, the Commodore proved a good alibi. He has relinquished his active connection with racing to his son, a young enthusiast, who handles the *Don* very successfully.

* * *

When Samson's locks were shorn his strength departed from him. And Fred Barry, the great interstate record man on the motor cycles, has parted with his moustache, likewise his speed ambitions awheel.

* * *

Mr. A. V. Turner for a brief period regained the Melbourne-to-Sydney record, and made the express time between the cities look poorer than it did before. After losing probably an hour and a half through punctures of a varied description and having his car damaged by the awful racketting it had undergone on the frequently elementary roads at high speed, he finished up the last 170 miles of torture for his plucky passenger, Mr. B. Kirton, by breaking the limited's time by 16 minutes. It is no joke to hold a tin of petrol between your knees on, say, the Parramatta Road, for a journey to Parramatta, but to cuddle a succession of them as Mr. Kirton did from Gunning to Sydney is about as heroic a sacrific on the altar of sport as we have heard of.

* * *

The Chief Commissioner for Railways (Mr. Fraser) emphasizes that it is impossible for railways, which have a burden of £3,500,000 interest and £2,000,000 maintenance to meet on their lines, to compete with motor transport, which finds roads provided free gratis by the general public. It should not be forgotten, however, that those roads are not solely reserved for the use of motor vehicles, but are available for all. The improved value of all property in townships served by good roads, the reduced wear and tear of every form of traffic using them, even down to the boots and shoes of pedestrians, and, in distant towns, the reduction in the cost of living made possible by the cheaper freights at which motor lorries will more rapidly deliver goods to the grocers for sale, are all items which help to reduce the burden of taxation to pay for the good roads, and make them a very gilt-edged investment for the country.

* * *

America, in the midst of her road improvement campaign, has devised a characteristically ingenious method of automatic traffic regulation, according to Mr. Claude McIntosh. The latest highways there are composed of two strips of smooth concrete, each nine feet wide, separated by an eight-feet strip of rough asphalt. Fast cars, after passing slow ones, waste no time about returning to their own side of the road, naturally.

* * *

What history that 565 miles strip of agony known as the Melbourne to Sydney main road could tell of the sporting efforts to traverse it in the quickest time on record. From high bicycle to the latest six-cylinder automobile every kind of speed instrument has had a go at it, and even aeroplanes have not disdained to establish record times between the capitals. The best respective times at present are:—

Aeroplane, 3 hours 55 mins., Captains Cherry and Hepburn.

Motor car, 15 hours 36 mins., Croysdill and Norman Smith.

Motor cycle, 17 hours 33 mins., A. Sadler.

Motor cycle and sidecar, 18 hours 15 mins., C. Wood and C. Sainty.

Bicycle, 49 hours, E. A. Pearson.

New Brisbane-Sydney Record.

Mr. Boyd Edkins made a successful attempt on the Brisbane-Sydney record on December 12, and covered the 643 miles in 18 hours 58 minutes, thus reducing the former record of 19 hours 38½ minutes, established by Mr. F. Eagar some years ago. Mr. Edkins left Brisbane at 3 a.m., and passed through Tenterfield at 9.30 Glen Innes 11, Armidale 12.55 p.m., Tamworth 2.43, Scone 4.36, Singleton 5.35, and Wiseman's Ferry at 8.10 p.m. The machine used was a 30-stroke, 98 *Vauxhall*, of the 1921 model, shod with *Dunlop* tyres. "It was a magnificent run," said Mr. Edkins. "We did not experience any tyre troubles, while the engine ran sweetly over the roughest roads. Passing through

Tenterfield and Tamworth heavy torrential rains were met, but the climatic conditions through Scone and Singleton were glorious."

Mr. Edkins's best previous attempt from Brisbane to Sydney was on December 22, 1917, when he drove a 25-horse power *Vauxhall* from Brisbane to Sydney in 26 hours 3 minutes, or 27 minutes faster than the express train.

What to Do in an Emergnecy. Forethought Better than Instinct in Tight Corners.

It was a sure thing, as the Americans say, in days gone by, that if one were careful and expert a motoring accident could only occur through some failure of the machine. To-day one's safety is not in one's own keeping. The most careful, the most expert, is at the mercy of every incompetent, or reckless, or inexperienced driver, and the vast increase in the volume of motor traffic of every description in itself has increased the unavoidable risks of motoring to a considerable degree. The general public has become educated to the wisdom and necessity of avoiding motors by the exercise of a little prevision and common sense. The motoring public, I am sorry to say, does not appear to have learned the same lesson as thoroughly as it ought to have, or as the situation demands. It takes too much for granted; fails to appreciate the changing circumstances of road traffic due to itself; neglects to differentiate between the risks present under normal and under holiday conditions.

I do not know if other motorists have followed such a plan, but in quite the early days of my career as a driver I schooled myself to meet possible emergencies by thinking out in advance what I would do should certain contingencies arise. I think that a wiser course than to wait until something happens and then escape it by impromptu measures. At least on one occasion my prevision saved me from serious consequences. It was in the early days, and I was invited to assist in the demonstration run of a newly imported car of special speed merit. It was sulky for some

time after we started, and the demonstrator was unhappy. At last he got the carburetter setting correctly, and, no doubt anxious to demonstrate the speed of the car so convincingly as to expunge its early sluggishness, took a blind corner so fast that he had to slam on his brakes so roughly that the outer driving wheel collapsed under the sudden strain. I knew that corner, and was convinced that we could not get round at our speed, and so, according to plan, decided to keep rolling as long as possible if fortunate enough to be flung clear, should anything happen. I was lucky, for we went over at an open spot, and I just rolled clear of the upturned car—the only one of five to escape serious injury.

In course of time one acquires a sort of manipulative instinct in motoring matters, which is much more valuable than any carefully thought-out plan can be; but, lacking such experience, a mental rehearsal such as I suggest will be found of the greatest value. The only reason why novices, or comparatively inexperienced drivers, are more often involved in accidents than the older hands is that no one can think out quickly and coolly the best or proper way out of a difficulty that develops in a matter of seconds. The older hand acts intuitively and escapes; the novice flounders, and, unless lucky, becomes a casualty. If he has schooled himself as I suggest the difficulty is half solved, for it requires but the nerve and decision to put the devised plan into execution. The first and unhesitating thing to do in almost every traffic difficulty is to cut out and de-clutch. Sometimes there is more danger in promptly applying brakes than in keeping up speed in order to win clear; but generally the line of safety is to brake, and brake heavily, so long as one is not turning nor has to turn abruptly at the same time. The novice usually is prone to be tender with his brakes, because he has been warned that braking roughly destroys tyres. But there is no alternative.

A Weak Point in Starters.

Trouble with starters is rarely of an electrical nature, as there is nothing to go wrong. The armature and field coils of an average well-constructed starter will stand a lot of severe usage without the slightest injury from powerful initial currents; the starter trouble one hears most about is mechanical, namely, that jamming of the automatic pinion, which not only puts the starter out of action, but "locks" the engine. It is a remarkable fact that this admittedly ingenious mechanism may, on a bed-plate test, engage and disengage 10,000 or more times without a single failure and yet under road conditions it occasionally jams after a short mileage. The trend towards building-in the starter with the engine, thus casing in the engaging mechanism, seriously accentuates the trouble should it occur, as it is impossible for an owner-driver to free the pinion. Previously the exposed starter pinion gave some minor trouble in the event of grit getting in the thread, but this was easy to remedy once the cause was located. The only possible way to ensure freedom from starter trouble would seem to be to adopt the chain-driven permanently geared starter-dynamo. The chain drive has proved its reliability for camshaft and other drives, and is excellently adapted for a starter. There has been doubt from the first whether the small pinion gear would stand up to the work imposed by ordinary driving conditions, and, subject as it is to sudden shocks and the transmission of very heavy momentary torques, out of all proportion to its strength, it is not surprising that it does occasionally fail.

A Young Driver.

A boy aged only six years has been driving a *Ford* van in the outskirts of Paris. He is not yet allowed to venture on the roads, says "The Motor," but he handles his car on the open ground of an aerodrome with the greatest skill.

PERSONAL.

A recent visitor to Sydney was Mr. C. Hardcastle, of P. A. Hardcastle & Co., Ltd., distributors of *Willys Knight* and *Overland* cars throughout the Argentine and Chili.

Mr. F. W. Fenn, Secretary of the National Motor Truck Company of the National Automobile Chamber of Commerce, New York, is desirous of co-operating with Australian motorists in any matter of common interest. Mr. H. C. Morgan,

Secretary of the Royal Automobile Club of Australia, will furnish further particulas to anyone desirous of communicating with Mr. Fenn .

Mr. Reg Hall, who has just retired from the position of honorary secretary of the Northern Suburbs Motor Cycle Club, was presented by the members with a gold badge and an illuminated address as a memento of his association with the club.

Mr. T. Sulman won the point-score competition of the Northern Suburbs M.C.C. for 1922.

Mr. C. E. Poole, factory representative for the Hupmobile Car Corporation, has returned to Sydney full of praise for the charms and scenery of New Zealand, where he toured for a month.

How to Silence that Annoying Squeak. Small Sounds Succumb Speedily to Scientific Suppression.

While yet one may work upon the car in the open sunshine, it is well to seek out the small squeaks and creaks that a summer's poundings have produced in the closed car, for there is no place like the open driveway on a sunny day in which to ferret out the causes of obscure sounds and to remedy them.

The shuddering hubbub of the doors when crossing car tracks, their mouse-like squeaking when rounding curves or undulating over choppy pavements—these things bespeak attention to the rubber buffers on the door posts and tightening of the hinges. There is no perfectly rigid frame or body, and continued weaving of the two is bound to loosen the hinges and wear down the rubber buffers. Every time the door is slammed both hinges and buffers lose a little of their enthusiasm.

The little rubber blocks are set in the door post with screws. By the end of the season they are apt to be brittle and either hard or mushy. They are cheaply and easily replaced, the new block reaching out to meet the door and holding it snugly against the latch. Loosened hinges may only need a half turn or so on their screws to cause them to foreswear their listlessness and hold the door firmly and snugly in its proper place. Sometimes, though, the screws are neglected so long that they begin working in the wood, thus soon wearing the threads in the hole until so little "bite" is left that further tightening is impracticable. In this case the screws and hinge should be removed and the hole bored out cleanly. A small wood rod, such as used for cheap flags, lollypops and these new-fangled structural toys is then dipped in glue and forced into the hole. When this rod is cut off and trimmed flush with a jack-knife; a small gimlet can be used to start a new screw-hole in the centre of the dowel or wooden plug. It will be found that the screw will hold better in the dowel than in the original piece. Of course, a larger screw can be used if the hinge will take it and there is enough wood in the door post to accommodate it.

Rattling Screens.—Nothing is quite so potent in robbing a closed car of its sungness as rattling window-panes. In most closed bodies the glass itself slides in the frame of the window or door, little metal channels being provided for the purpose. These are usually padded with felt to silence and protect the glass, while permitting it to slide freely. The felt mats down in time, however, and the pane de-

velops a rattle. It is easily replaced, however, upon removal of the old felt. The first preliminary after the old felt has been torn out is to clean out the channel, alcohol being the best for the purpose. When dry shellac should be applied to the inside with a small brush and the felt inserted before it has dried.

Chattering Locks.—The door locks sometimes are responsible for a clattering. This is usually due to lost motion in the inside lever. A small felt pad at the end of the slot nearest which the lever normally stands will prevent this.

Creaking of the body joints, mostly accompanied by rumbling of the body sills on the frame rails, usually results from loose body clips or bolts, by which the body is attached to the frame. All of the hood latches should also receive attention, being the unsuspected cause of much noise on most cars. An occasional drop or two of oil is all they require.

Motor Tour for New Year Holidays.

Many tours can be arranged far into country districts if motorists care to take sufficient food with them and "rough it" a bit. They will return to Sydney not only rejuvenated with gum-leaf tonic, but their new acquaintance with the character of the country—which to them previously was simply a printed name in a map of New South Wales—will tempt them to exploit a fresh district when the opportunity for another holiday comes around.

Mr. S. L. Tyler, director of McIntosh & Sons, Ltd., distributors of the *Buick,* advises the following trip:—

"A very pleasant three days' trip from Sydney and return, for the most part the roads are excellent, proceed from Sydney to Bathurst the first day, a distance of 124 miles; leave Bathurst and proceed to Sofala, 30 miles. This is over excellent roads, although mountainous. Some of the best gold diggings of the State are seen, some of which are working. At Sofala there is a comfortable hotel, where motorists are well received. From Sofala proceed to Hill End, distance 23 miles. The roads are excellent, very mountainous, but perfectly safe.

"From Hill End proceed to Mudgee, a distance of 42 miles, via Hargraves.

"Stay overnight at Mudgee, and return to Sydney by the main road, which is good the whole of the way, except round about Lidsdale and Marangaroo. This part of the road is rather rough, owing to railway construction deviation works going on; but if desired the whole of this can be avoided by turning into Wallerawang and coming from Wallerawang to Rydal, a distance of seven miles over a pretty fair road. From Mudgee direct is approximately 169 miles, and via Wallerawang and Rydal about four or five miles farther. In my opinion, this is one of the best three days' trips one can undertake. The beautiful panoramic views leave an impression in one's mind for a long time afterwards.

New Sydney-Melbourne Record Goes to Credit of Essex Car.

Records, like pie crusts, seem made to be broken, for no sooner did Mr. A. V. Turner regain the coveted Sydney-Melbourne record than Messrs. Croysdill and Norman Smith, in a practically standard *Essex,* clipped one hour eight minutes off the time occupied in motoring between the two capitals Now, will Mr. Boyd Edkins, before he lays up his trusty *Vauxhall,* have one more cut at the "ashes," which have up to quite recently been in his keeping for the last 6½ years?

WIRELESS INSTITUTE OF AUSTRALIA

NEW SOUTH WALES DIVISION

A GENERAL meeting of the N.S.W. Division of the Wireless Institute of Australia, held on Thursday, December 7, 1922, at the Railway Institute, Sydney, was presided over by Mr. C. P. Bartholomew.

The following applicants were, on the recommendation of the Council, elected as members: Mr. S. Colville and Mr. W. G. Keogh.

The Treasurer (Mr. O. F. Mingay), acting on a recommendation from the Council, moved: "That the annual subscription rate be increased to £3 3s. per annum for full membership, and £2 2s. per annum for associate members, to take effect from January 1, 1923, in the case of new members, and from April 1, 1923, in respect to existing members." It was claimed on behalf of the motion that as this Institute was a registered body and possessed the majority of more advanced amateurs and experimenters, both professional and otherwise, it was the duty of the Council to provide scientific and more advanced lectures, and in general to conduct the Institute in a more progressive manner than hitherto.

The motion was seconded by Mr. Basil Cooke, and strongly supported by Mr. Phil Renshaw, who said it was the aim of the Council to make the Wireless Institute the premier radio body in this country. Mr. H. Stowe also supported the motion. All present thoroughly realised the necessity for this step, and the motion was carried unanimously.

The Chairman then called on Mr. F. Basil Cooke to deliver his lecture on ',Resonance." (A full report of the lecture appears in this issue.—Ed.)

At the conclusion of Mr. Basil Cooke's lecture, which was marked by loud applause, Mr. H. Stowe delivered a very interesting lecture on "The Construction and Uses of a Wavemeter." He pointed out the great difficulty he had experienced when using a buzzer to calibrate with, when errors from 15 to 30 metres often crept in. In explaining the points to be observed in constructing such an instrument he emphasised the necessity for a large capacity .001 mfd. at least, and also that the mechanical properties of the condenser should be rigid. The question of tapped coils was much discussed, and for laboratory instruments it is specially recommended that individual coils be fixed in position. Mr. Stowe strongly recommended the completion of the wavemeter prior to calibration, as the difference in leads, etc., makes an appreciable difference. He expounded eight methods whereby the error due to the buzzer could be eliminated, three wavemeter, the standard, the buzzing, and the receiving meter which is to be measured, and by calibrating the buzzing meter to that of the standard, and then in turn receive the buzzing on the third meter, the inaccuracy of the buzzer is eliminated. Several methods of calibrating aerials and other apparatus was dealt with.

Mr. Phil Renshaw moved a vote of thanks to the lecturers, which was carried by acclamation.

Mr. Newman was accorded a vote of thanks for arranging for the new meeting place.

The members unanimously decided that the evening's business was both interesting and instructive. It is the policy of the Institute to provide many more lectures of a similar kind in the future.

The next meeting will be held at the Sydney University, when Mr. Edgar Booth, M.C., B.Sc., has kindly agreed to lecture on "Sound Ranging Appliances in Peace and War," before Institute members and friends.

The Secretary can be communicated with at Box 3120, G.P.O., Sydney.

SOUTH AUSTRALIAN DIVISION

THE monthly meeting of the above was held on Wednesday, December 6, in the University of Adelaide.

The President (Mr. Hambly Clarke) presided over a large and representative attendance of members.

Four applications for membership were received, and all were duly elected.

In a short address the President drew members' attention to the new regulations, which, he thought, would considerably improve the amateur position.

The lecturer for the evening was Mr. Austin, who had prepared a very interesting discourse on "Valve Circuits."

Mr. Austen showed a number of practical circuits not in general use, some of which had proved to be very efficient, and as good as some of the more elaborate circuits now in use. With the aid of a blackboard he exhibited diagrams of circuits ranging from the simple crystal detector and slide tuner to the more complex three-valve amplifier, all of which he explained in a very clear and concise manner.

Mr. Caldwell introduced an interesting discussion on the "heterodyne principle, which the lecturer described fully.

In proposing a vote of thanks to Mr. Austin for his very able and instructive lecture, the President extended the compliments of the season to the members, and hoped that the next year would prove to be one of considerable advancement in radio, more especially to the Australian amateur.

TRANS-PACIFIC SIGNALS

AUSTRALIAN AMATEURS PREPARING

GREAT interest is being displayed by radio experimenters in Australa in the forthcoming trans-Pacific tests, which are to commence on **May 1, 1923.**

At a well-represented meeting, held in Sydney on December 6, it was unanimously decided to form a committee to carry out the necessary orginzation of the experimental wireless stations in N.S.W. for successfully receiving the wireless signals to be transmitted by American amateurs.

The main points of this organization are as follow:—

(a) To avoid all interference between stations receiving the signals on account of most stations probably using regenerative circuits, and thus causing interference one with another.

(b) To arrange that no interference be caused by experimenters listening in who are not taking part in the tests.

The committee feel that the obligation upon every experimenter, more especially those in the congested wireless area in N.S.W., is to do either of the following:—

(a) Enter for the test; or

(b) if not taking part in the tests, agree not to operate his station during the times that the signals will be received.

These times will probably only comprise one hour each night, and are expected to be arranged at a time when the least interference is likely to be caused.

Signals will be transmitted by American amateur stations on wave lengths between 250 and 350 metres, and the power used will be up to 1 kilowatt C.W., and C.W. telephone will be used.

Special amateur stations are actually being built on the Californian coast in an endeavour to reach Australia. The tests will probably last one hour each evening for two or three weeks. Further particulars will be supplied later when the information comes to hand.

Mr. Kingsley Love, of the Victorian Division of the Wireless Institute of Australia, is the general organizer for Australia, whilst Mr. Malcolm Perry is chairman of the N.S.W. Organizing Section. The hon. secretary and treasurer of the N.S.W. Organization Committee is Mr. Harvey, of

Nelson Bay Road, Bronte, to whom all communications should be addressed.

This stunt that is being put up will be one of the biggest events that has taken place amongst wireless experimenters since the last trans-Atlantic tests between America and Great Britain. All the American stations will be keen on reaching Australia, and the Australains, in turn, will be very keen on picking up America.

It is essential to impress upon all experimenters not entering for the tests that it is the desire of the committee that their stations be closed down during the exact times that signals are being received. This will not entail much hardship on those not taking part, as the times will be of short duration, not more than an hour each evening, and probably between 6 and 7 p.m.

In addition to experimenters working solely on their own stations, groups of ex-station experimenters will be arranged on the one station and work in conjunction.

Mr. C. D. Maclurcan will have a large body of experimenters working at his station, and similarly other leading experimenters are all co-operating in order to make certain of success.

Two forms have been distributed amongst experimenters, one of which it is necessary to fill in with the required particulars if the recipient is taking part in the test, and the other is in the form of an undertaking not to operate his station during the times mentioned if he is not an entrant for the test.

The entrance fee has been fixed at 10s. for each station. Any number of experimenters can be entered under one station. Already many prizes have been donated, and prizes will also be given out of the surplus funds of the organization.

It is essential, to bring success to the movement, that every experimenter in N.S.W. should sign one of the two forms and return it to the Hon. Secretary at the earliest possible moment in order to facilitate the organization work, which will be exceptionally heavy.

The closing date for entries has been definitely fixed for February 28, 1923, but in order to get the organization well ahead the committee want those concerned to send their applications in by return of post if possible.

Chairman N.S.W. Section, Mr. Malcolm Perry; Hon. Secretary and Treasurer, F. H. Harvey; Committee: Messrs. Bowman, A. W. McKellar, G. Thompson, G. Tatham, R. H. Howell, and Lavington.

WIRELESS NOTES.

Hints to Experimenters.

The summer months are coming, the time when thunderstorms break loose, and there is plenty of static. Insert a change over switch in your aerial just before the lead-in wire comes into your operating-room. A better idea is to put a micrometer gap arrester across the aerial and earth; this will save you the trouble of always making sure that your aerial is earthed when there are thunderstorms about.

The majority of valves work on the filament between three and five volts . Therefore, if you are using a six-volt accumulator make certain you have a 10-ohm filament resistance in circuit in order to get down to the required voltage.

Never switch the filament on and off or use it as a night lamp. When first starting up run the filament resistance up slowly, and when shutting down turn the current off in the same manner. Wireless operators on ships never switch off their valves, even when the station is not in operation; they leave the filament burning just a very dull red.

Put a two-pin plug or jack on the end of your telephone cord. If you want to leave your set and go to another part of your room to get another instrument this will save you the trouble of putting your 'phones off and on again. Also put a hook on the side of your table; you can hang 'phones on these when not in use, and prevent them from being accidentally knocked on to the floor.

Avoid all changes of direction in your aerial down leads. If you are using a regenerative circuit your aerial has to oscillate, and the best transmitting is therefore the best receiving aerial.

Remember that tuning by inductance is better than tuning with capacity. If you are thinking of entering for the trans-Pacific Radio Tests you will have to receive on wave lengths 250 and 350 metres. Therefore, make sure the natural wave

length of your aerial is not over 300 metres; the other 50 metres will be useful in your primary inductance.

The Latest Telephone Receivers.

Advice has been received that Messrs. S. G .Brown, Ltd., of London, the well-known telephone manufacturers, have placed on the market a new type of "Featherweight" receivers. They are known as type F.

They have quite a number of new and novel features incorporated in their design, and the standard of efficiency and quality of workmanship is precisely the same as embodied in their well-known type A 'phones.

The case is constructed of highly polished aluminium, with a finely finished ear-cap, and it contains a special form of magnet, the poles of whch are ground perfectly true, and give great efficiency. The headbands are made of duralumin, and fitted with a double swivel motion, giving the maximum of comfort to the user, and finished in the same way as the case.

One of the outstanding features next to efficiency is their extreme lightness, the total weight, including cords, being only 6 ozs., and they may be considered the lightest telephones on the market. They should prove a boon to the experimenter who uses head 'phones for lengthy periods of time. Australectric, Ltd., of Clarence Street, Sydney, are the sole distributing agents for Australasia and New Zealand.

A Popular Valve.

The Marconi V 24 valve seems to be getting more popular than ever, judging by the numerous letters from our correspondents asking where the valve can be obtained. We have made enquiries from Amalgamated Wireless, and they inform us that they have quadrupled their orders to London; no sooner do shipments arrive than they are sold out.

Which is the Best Crystal?

This argument never seems to have been satisfactorily settled. Although crystals are out of date compared with the valve, still nearly every person commencing wireless experiments even now starts on a crystal detector and later on changes over to a valve. Before the war silicon held the lead for a couple of years, and Mr. Jack Pike put up the first record with it by receiving signals from a steamer in New Zealand. After silicon came galena, carborundum (used with a battery and potentiometer), zincite, bornite and iron pyrites. An experimenter has just submitted to us a new crystal made in America, known as "Pickled Iron Pyrites." He writes: "With a piece of piano wire laid across the sharp edge of the crystal I have no difficulty at all in picking up Melbourne, Adelaide, Hobart and Brisbane, and some nights I get Awanui Station in New Zealand." This seems to us a wonderful performance, and the Editor would like to suggest to experimenters to try "Pickling" valves.

COASTAL RADIO SERVICE.

Staff Changes.

Buchan, D., Relieving Radiotelegraphist, has returned to his headquarters (Melbourne Radio) after relieving at King Island.

Harrower, A., Relieving Radiotelegraphist, has been transferred from Brisbane Radio to Rockhampton Radio for relief purposes.

Phillips, G. G., Radiotelegraphist-in-Charge, King Island Radio, has been transferred to Telegraphist, 4th class, Postmaster-General's Department, Brisbane.

Lemmon, C. E., Radiotelegraphist, Sydney Radio, has been granted six months' leave without pay as from December 1, 1922.

Preparing for the Boom.

There is no doubt whatever that the radio boom which is now sweeping through America and Great Britain like a tidal wave will very soon reach Australia. A census recently taken in a city in the middle west of America revealed the astounding fact that of 200,000 homes 84,000 were equipped with radio receivers; and it is safe to say that before long a very large proportion of Australian homes will possess radio outfits for evening amusement, entertainment of visitors, etc.

Before contemplating a radio installation, however, it is highly essential that one should have a working knowledge of the subject, and the amateur or beginner could not do better than acquire this from "The Wireless Experimenter's Manual," by Elmer E. Bucher.

This well-known, recognized standard text book is thoroughly up to date, and covers the whole field of amateur wireless, with a wealth of circuits, diagrams and illustrations, in a very clear manner.

The price of this book, which is obtainable from The Wireless Press, 97 Clarence Street, Sydney, is 18s. 6d. post free, and the outlay is amply repaid, in that the experimenter has constantly at his elbow a sure and steady guide to which he can refer, no matter on what particular lines he wishes to work.

ITEMS OF INTEREST.

During the last three months Amalgamated Wireless coastal stations have effected several long distance records, and it appears that such consistent long-range transmission is not equalled by wireless stations of similar power in any other part of the world.

These results are not confined to one State, but are regularly reported throughout the Commonwealth.

One of the most interesting was on August 2, the *Makura,* whilst at a distance of 3,168 miles, having received messages direct from Sydney Wireless Station.

On June 26, whilst on her great circular track, signals were exchanged with the s.s. *Argyllshire* by Adelaide, 4,547 miles distant. One of the best daylight results was effected by the well-known coaster *Katoomba* in working the Geraldton station at over 1,100 miles.

PERSONAL NOTES.

Mr. Maclurcan has closed down his station for the next two months, and, with his family, is taking a well-earned holiday at Cronulla.

We are pleased to report that Mr. H. R. Gregory, a prominent member of the Wireless Institute, is rapidly recovering from a recent illness.

Mr. Basil Cooke is now managing the Radio Company, of Grosvenor Street, Sydney.

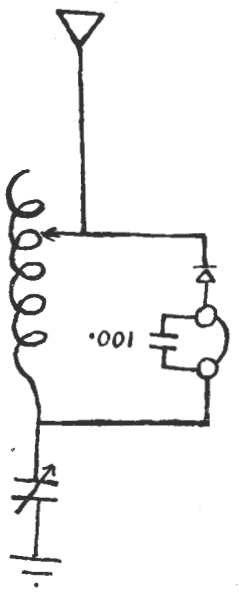
Mr. Frank Leverrier, K.C., has moved from his residence in McPherson Street, Waverley, to Vaucluse. His many radio friends in Waverley will no doubt miss the kindly advice and instruction so freely given by him at all times. At a general meeting of the Waverley Amateur Club he was unanimously elected Hon. Vice-President of the club.

Mr. E. B. Crocker, of 14 Roseberry Street, Marrickville, is getting very good results with his transmitting set. He is using a 5-watt Radiotron Valve, and his wave length is 410 metres. Mr. Vears, of Katoomba, has heard his carrier wave, and Mr. Walters, of Eastwood, has heard his telephony on a crystal.

Mr. D. P. Prendergast, of Charleville, Queensland, an enthusiastic experimenter, recently spent a holiday in Sydney.

A Good Performance.

This is a description of the very simple apparatus used by Mr. A. Hinks, on which he received Mr. Maclurcan's concert at Mulgoa, 40 miles distant. As far as Mr. Maclurcan knows this is a record for a crystal set.



A single slide tuner is used, 4 inches diameter, wound with 350 turns of No. 24 gauge wire. The crystal is silicon with a gold contact. 'Phones, 8,000 ohm Browns.

BOOK REVIEW.

Direction and Position Finding by Wireless. By R. Keen, B. Eng. A.M.I.E.E.

The subject of direction and position finding by means of wireless telegraphy, and also its literature which has been published from time to time, is now so extensive that separate treatment of this branch is warranted.

The numerous text books dealing with wireless signalling are unable to deal in detail with the development of this branch, and wireless engineers, operators and others interested will therefore welcome this book, which fills a long-felt want. The information contained therein is not so much of an academic nature generally met with in text books dealing with wireless telegraphy, as a practical treatise on the principles of the subject. In 355 pages of good readable type there are no fewer than 254 illustrations, and some 140 references to original papers and other works on the subject up to and including the present year.

The theory of the wireless direction finder is dealt with in a very comprehensive manner, and a chapter is devoted to valve circuits employed in amplifiers commonly met with in this branch of the art. Descriptions and constructional details are also given of the most modern D.F. installations at present used for shore service, and for navigation of ships and aircraft.

The information dealing with maps and charts and their uses in position finding, together with the notes on field and nautical astronomy should also be of considerable value, particularly to those interested in the installation and operation of position finding apparatus.

Copies from the Wireless Press, Sydney and Melbourne. Price, 12s. 6d. each.

RESONANCE.

By F. BASIL-COOK, F.R.A.S.

The subject of "resonance" is one which has occupied the attention of scientists and engineers from very early history. When applied to wireless it forms one of the most vital features in obtaining the maximum efficiency. It is the basis of tuning, and we all know how important it is to have our set properly tuned, either for transmitting or receiving.

Although this subject is familiar to most of us, yet I venture to present it in the hope of still more emphatically showing its significance.

To commence with, I propose to deal with sound and similar mechanical resonance. Every body in space has a definite period of vibration and will oscillate, or, rather, vibrate, if given the opportunity, with a definite periodicity or frequency. As another axiom we might state that if two bodies whose natural frequency are the same are brought together so that any disturbance affecting one will affect both, then these two bodies will be in resonance, or, as it is usually stated, they are resonant. I imagine a very heavy and long pendulum, such, for example, as one of the city cranes, with a huge slab of stone at one end of the rope. Endeavour to set this pendulum vibrating by pushing on it and very small success will reward one; yet, by using the principle of resonance, a tack hammer may be used to achieve this object. Tap the stone exactly in resonance with the pendulum, and, if persistent, the small taps will add up in time, and if desired and the operator is sufficiently patient the stone will swing completely round the circle overhead.

Again, take two tuning forks. They both have the same period of vibration. By striking one and then stopping it vibrating you all hear the other one carrying on the sound. In this case the first fork when vibrating was sending small air waves in resonance with the other fork. Each wave or impulse hit the fork at the same period of the forks' natural swing, and gradually built up until the fork was set in motion and gave out the same note as the first. Of course, the whole operation only took a fraction of a second.

Now take another fork. By striking the original one and now stopping it the second fork shows no tendency to carry on because it is not in resonance.

There are scores of other experiments one might perform if further evidence of resonance were required. If one were sufficiently persistent he could knock over the Town Hall with a pea shooter. The peas would have to strike the Town Hall in resonance with its natural frequency and eventually the building would collapse. Personally I have seen a wine glass shattered to powder by a lady striking a certain note on her violin at the other end of the room. It just happened that the glass was resonant with the frequency of the note, and was set in vibration, which built up until the strain on the glass became too great and the inevitable happened.

Soldiers marching over a bridge are ordered to break step for fear that their rythmic step might be resonant with some vital part of the structure, in which case history would repeat itself and the bridge would collapse.

These examples, can be multiplied *ad lib*, but the effect is so familiar to everybody that the above examples will be sufficient to refresh the memory on this interesting and important subject.

Concluding, therefore, it will now be obvious that we must have our receiver tuned very exactly to the frequency (or wave length) of the incoming signal in order that we can utilize to the utmost this curious effect of resonance. The very weak impulses arriving from the distant transmitter will build themselves up to workable strength if they have a resonant circuit to work on, but if not their effect will be practically nil.

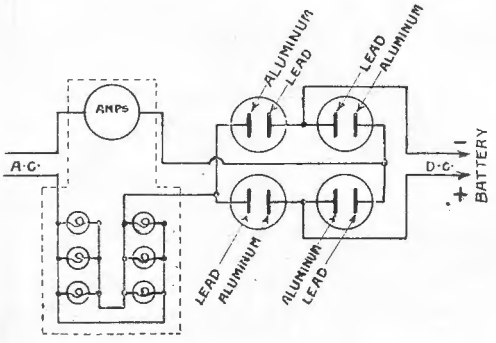
The moral is, therefore, pay very great attention to the tuning of your sets.

AN ELECTROLYTIC RECTIFIER.

By A. J. KNOWLTON.

A big problem in the operation of a "V.T." set is the charging of the A battery. As most of the current now supplied in the home is A. C., the battery cannot be coupled to the main line. Something is needed to change this alternating current into a uni-directional current. This may be accomplished in several ways such as by a mercury vapour rectifier, a two element bulb containing argon gas, a magnetic rec-

tifier or an electrolytic rectifier. The last of these is very easily made, and cannot get out of order nor are any adjustments necessary. There are two types of electrolytic rectifiers. One rectifies both halves of the cycle, the other only one half. The



ELECTROLYTIC RECTIFIER
FIG. 1.

latter one will charge a battery very nicely. To make it get a piece of aluminum and a piece of lead about five inches wide and ten inches long. Put a binding post on each and place them in a two-gallon jar (a butter crock is the most satisfactory, and costs only 45c.). See that there is at least an inch between them. Now make a saturated solution of borax and water and fill the jar to about two inches of the top. The next thing necessary is a board with about six porcelain receptacles screwed to it. These are wired in series with the main line but in parallel with one another.

The ammeter is not necessary, but is very useful. Any form of resistance may be used. I use an electric iron, a heater and a two-hundred watt lamp and get 7½ amperes through the battery. When you have completed this it is only necessary to form the plate on the aluminum. To do do this put in your resistance, short the battery leads and turn on the "juice." After about ten minutes the lights will begin to flicker and a very light brown deposit will be noticed on the aluminum plate. The rectifier is now ready to work.

It is very important that the leads from the lead plate go to the negative of the storage battery.

Effect of Broadcasting on Piano Trade.

A speaker at the Music Industries Convention at Blackpool recently uttered a warning that wireless broadcasting might supplant home music to a certain extent and reduce the demand for pianos and other musical instruments. Mr. Louis Sterling, president of the Music Industries Federation, took the opposite view, in the course of a statement made subsequently.

Far from hurting the music industry, said Mr. Sterling, broadcasting would stimulate it. In the march of science there had never been a great invention yet that had not been in the long run of incalculable benefit to the industry with which it was concerned. When gramophones were invented people said they would kill pianos; the cinema was fully expected to give its quietus to the legitimate stage; vaudeville was at first looked on as the death dance of musical comedy.

None of those things had happened, and the new had in every case benefited the old. Appetite grew on what it fed upon, and the more good music the people got from broadcasting the more they would want from their own gramophones and pianos.

ENCOURAGING EXPERIMENTERS.

The following have already offered prizes to be competed for by experimenters taking part in the trans-Pacific Radio Tests, particulars of which will be given as soon as the general organization work of the committee is complete.

Colville & Moore.
Mr. B. Cooke, Manager of the Radio Company.
Electricity House.
Mr. Malcolm Perry.
Mr. F. E. O'Sullivan.
Electrical Utilities.
Burgin Electric Co.

We have pleasure in publishing the following letter from Australectric, Limited:

"The Editor,
"'Sea, Land & Air.'

"Dear Sir,—We have much pleasure in offering a prize to the winner of the trans-Pacific Radio Tests, which are to commence in May next, and would be pleased if you would publish this letter in your magazine for the information of experimenters in New South Wales.

"As full particulars of the tests have not yet been received, we are sorry we cannot make any definite announcement as to the nature of the prize. We hope, however, to be able to do so in your next issue.

"Yours faithfully,
Australectric, Limited."

NOTICE TO EXPERIMENTERS.

"Sea, Land & Air" has arranged with Mr. J. G. Reed, Radio Engineer, to write a special article for the February issue on "Methods of Amplification and Designs for Apparatus Suitable for Short-Wave Reception." This article will have special reference to the trans-Pacific test. Every experimenter in Australia should read it.—Ed.

"Medical Aid by Wireless."

Once again the utility of wireless has been amply demonstrated. At 9.46 p.m. on the night of November 27 Thursday Island Radio received an urgent call from the s.s. *Havre*, requesting the immediate services of the local medical officer.

At 9.48 p.m. the port medical officer was communicated with and the case diagnosed as burns from iodine and corrosive sublimate. First-aid information was transmitted to the *Havre* at once, the complete operation being carried out by radio in the space of fifteen minutes.

Owing to the inclemency of the weather and the heavy seas running, intensified by a six-knot current in the bay, the acquisition of medical assistance by any other means would have been a very difficult and slow process.

The *Havre* was at anchor at 6 a.m. the following morning at Goode Island, where she was boarded by the medical officer. The patient was successfully treated, and the ship sailed south at 9 a.m.

LEICHHARDT AND DISTRICT RADIO SOCIETY.

The tenth general meeting of the members of the Leichhardt and District Radio Society was held in the Club Room, at No. 3 Annesley Street, Leichhardt, on Tuesday, December 12.

An interesting lecture on Accumulators was given by Mr. Fred Thompson, at the conclusion of which a discussion took place, which led from accumulators to valves and crystals, etc.

A hearty vote of thanks was then accorded to Mr. Thompson, following which Morse practice was entered upon until the close of the meeting.

The Hon. Secretary, Mr. W. J. Zech, 145 Booth Street, Annandale, will be pleased to receive any enquiries regarding the Society.

Meetings are held every Tuesday at No. 3 Annesley Street, Leichhardt.

ANOTHER LOW POWER RECORD BY 2 CM.

200 Miles Daylight on 1/7 Watt.

During low power transmission tests recently conducted by Mr. C. D. Maclurcan, Strathfield, signals were received and the test letter correctly noted by Mr. Channon, Inverell (350 miles), and also by Mr. L. V. G. Todd, Tamworth (200 miles). The input plate voltage was 60 and the current 6 milliamps; total power, .36 watts.

In a letter to Mr. Maclurcan, Mr. Channon says:—

"Your set seems to be in good going order to-night. The music, etc., came in better than I have ever heard it before. I am still using the single Expanse A Valve. The letters you sent were F, V, and W. There was considerable static, but I'm sure I could get your C.W. stuff with less power than the last you used to-night."

Mr. Channon little knew at the time that less than two-fifths of a watt was the lowest power used—and he wants less! These country radio men can show us a lot in the receiving line, but they are certainly hard to please.

Following on this another test was arranged with Mr. Todd in daylight, with the astonishing result that signals sent with a power of 1-7 watt were clearly received. Mr. Maclurcan's log shows the following particulars of the powers used:

5.45 p.m.	7.15 p.m.	Volts.	M. Amps.	Power. Watts.
J.	L	500	35	16.5
L	P	320	21	6.4
Q	X	120	11	1.21
K	C	90	8	.72
X	K	65	6	.39
M	M	50	5	.25
W	W	40	5	.2
O	O	35	4	.14

Crystal Receiving Record.

Mr. Maclurcan has received the following letter from Mr. H. Hinks, Mount View, Mulgoa:—

"Dear Sir,—I am writing to tell you that I heard your concert last night on a home-made crystal set, using a pair of Brown's 'phones, the lady's voice coming in very clear and also the steel guitar, of which I never missed a note.

"I have an aerial 600 feet long and about 80 feet at the highest point, single wire only 7/20g.

'I do not think it a bad performance for a crystal set, as the distance is about 40 miles.

"I would be very much obliged if you would let me know what power you were using last night, 26/11/'22. I may add that my call number is 2 I S."

Mr. Maclurcan informs us that this is, as far as he is aware, the furthest distance at which his concerts have been received on a crystal, and that he considers Mr. Hinks's performance a very excellent one. Even at five miles very skilful tuning is necessary with a crystal set, for there is no "carrierwave" to help the adjustment.

INTERVALVE AND TELEPHONE TRANSFORMERS

By J. G. REED, Radio Engineer

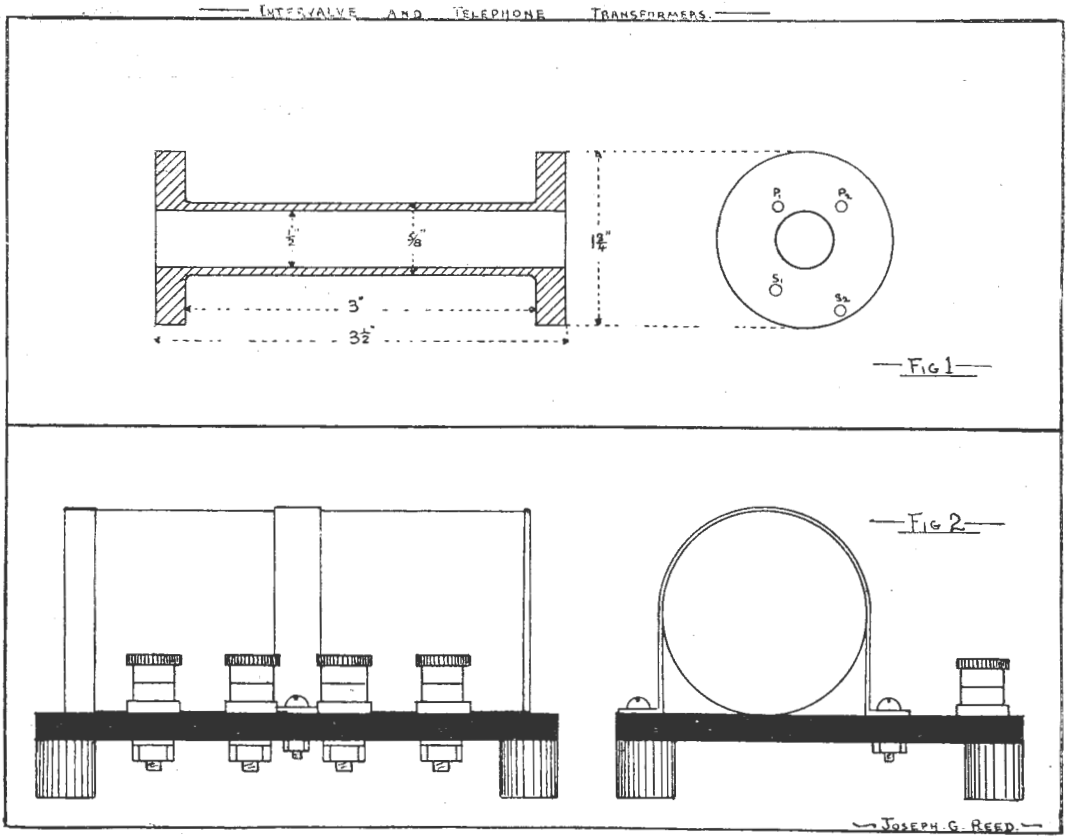
After listening in on a single valve receiver for a short time the experimenter is certain to feel the need of further amplification to increase the strength of weak signals. The simplest means of accomplishing this is to employ audio frequency amplification after the detecting tube, using iron core transformers for coupling purposes.

The function of these transformers is to extract the maximum amount of energy from the plate circuit and transfer it to grid of the following tube. According to one of the funda mental laws of electrical engineering, maximum energy is obtained from any generator when its impedance and that of the load are of equal value. In the case of a valve, the plate to filament path will be considered as the generator, and the primary winding of the transformer as the load. The average working impedance of a valve is in the neighbourhood of 40,000 to 50,000 ohms, therefore, a transformer with an impedance of about this value will have to be designed. An average signal frequency of 800 cycles will be assumed in the design, as this is the figure used by telephone engineers for speech work, and is approximately that of the beat note produced during the heterodyne reception of continuous wave signals.

The impedance of an inductive winding is equal to the geometric sum of the ohmic and inductive resistances, but as the direct current ohmic resistance is a small percentage of the total, and does not enter into the magnetic transference of energy from the primary to the secondary it will be neglected and only the 2piFL. component taken into account.

At 800 cycles per second each Henry of inductance will have a reactance equivalent to 5,000 ohms, therefore, to equal the impedance of the valve at least ten henries will be required. It is just here that the experimenter strikes trouble, because there is no reliable formula to calculate the winding for this value, and A.C. bridge measurments are beyond the scope of most amateurs. Having the latter facilities available, the author was able to develop the following design for a transformer:

The bobbin to accommodate the windings can be turned out from a solid block of close-



grained wood, 4-in. x 2-in. x 2-in., or built up from a piece o ffibre or hard rubber tubing ½-in. internal diameter and 1/16-in. thick, with end pieces of ¼-in. material screwed or glued on with thick shellac or seccotine. If the bobbin has been turned out from wood it must be sandpapered smooth and boiled in paraffin wax until bubbles cease to rise . Drill one of the ends of the bobbin with four ⅛-in. holes in the positions shown in Fig. 1 to allow the primary and secondary leads to pass in and out of the bobbin.

Owing to the large number of turns which will have to be wound on the bobbin, the quickest method of winding will be to support it in a lathe, or if this is not available an ordinary hand drilling machine held horizontally in a vise can be adapted with a little ingenuity. To prepare the bobbin for winding in a hand drill pass a 4½-in. x ¼-in. iron bolt down the centre hole, and with ¾-in. washers at both ends screw it up tightly, taking care that it is exactly central to prevent wobbling. Hol dthe end of the bolt in the chuck of the drilling machine or lathe. For insulation purposes cut several strips of Empire cloth ½-in. wide and 36 inches long. Cover the core with a layer of this tape, gumming it down at the end with a touch of seccotine. For the terminal wires of the winding prepare four pieces of No. 36 d.s.c. 12 inches long and four pieces of 3-36 stranded d.s.c. 18 inches long. The main winding of the coil consists of No. 44 S.W.G. enamel wire (preferably Beldenamel), of which about ½ lb. will be required for an intervalve transformer. To clean the end of the fine enamel wire draw it gently between two pieces of very fine sandpaper; do not attemp tto scrape it off with a knife or burn it in a gas flame, or trouble is likely to be experienced later owing to the wire breaking at this point. Thread the 3-36 wire through the first hole in the end of the bobbin for a distance of about 8 inches, then solder the inside end to the single No. 36 wire, which in turn is soldered to No. 44 wire. This method of tapering off the terminal leads prevents any severe strain on the enamel wire. All the soldered conncetions must be made with a non-corrosive flux. An ideal solder for this purpose is that known as tube solder, which has a central core of powdered resin. Failing this kind of solder, the ordinary stick material can be used, and a flux consisting of powdered resin dissolved in methylated spirits employed.

The primary winding consists of 10,000 turns of wire, having a resistance of approximately 2,200 ohms. For insulation purposes, and to guard against breakdown between the end turns of the winding, it is best to wind on 5,000 turns then put on a layer of Empire cloth tape, thereby dividing the winding into two sections. Between the primary and secondary windings wind two layers of this tape, because the potential difference is very high at this point. The use of the insulation in the form of a tape places less strain on the wires underneath than the usual method of covering with a single wide strip. The secondary consists of 40,000 turns of wire divided into four equal sections of 10,000 turns each. When all is wound on cover with several layers of Empire cloth, and as an additional measure a layer of waxed string provides a very strong protection for the underlying wires.

Now procure a small iron tin about 4 inches long by 2 inches diameter, and cut a slot at one end half an inch long by one-quarter wide. After filling the core of the bobbin with pieces of No. 22 annealed iron wire, place it inside the tin and pour in molten paraffin wax so as to thoroughly seal the coil from the effects of moisture. The four primary and secondary leads are covered with pieces of ⅛-in. Empire cloth tubing or bicycle valve rubber, and lead out through the slot at the side of the tin. When the wax has set hard put on the lid and give the tin a coat of black bicycle enamel. Take care to remove all traces of paraffin wax from the outside of the tin or the enamel will not adhere properly. Mount the outfit as shown in Fig. 2, and an extremely efficient intervalve transformer is complete.

Another very useful transformer is one for the telephone circuit, and it should be used by every experimenter who has any respect for his telephones. When it is considered that the 'phones are liable to be demagnetized or burned out by their employment direct in the high voltage plate circuit its use will be apparent. In addition to the protection that this transformer affords to the telephones, it also guards the operator against receiving unpleasant shocks when working on high voltage amplifier circuits. Occasionally, owing to the condensation of moisture within the telephones caused by prolonged use, leakage of current to the frame of the receivers takes place. It will only take one decent jolt through that little bald patch or the tips of the ears to convince you of the splendid isolation from the rest of the circuit that a telephone transformer affords.

The constructional details, with the exception of the secondary winding, are similar to the intervalve pattern. This winding consists of 10,000 turns of No. 40 S.W.G. enamel wire. Taps can be brought out at 2,500 and 5,000 turns respectively, giving a range of secondary impedances which will cover all telephones from the humble 75 ohm "proletariat" to the Baldwin mica diaphragm "bourgeoise." The following table will give the reader an idea of the approximate ohmic resistance and inductances of the windings of both transformers.

Transformer.	Primary		Secondary		
	Resis.	Ind.		Resis.	Ind.
Intervalve ..	2,200Ω	10H.		9,600Ω	160H.
Telephone ..	2,200Ω	10H.	(a)	200Ω	0.6H.
			(b)	450Ω	2.5H.
			(c)	980Ω	10.0H.

When using these transformers in valve circuits it is absolutely essential that they be shunted with a small fixed or variable condenser of about 0.001 microfarad to act as a by-pass circuit of low impedance for the radio frequency component of the plate current which flows through the detection tube.

AN INTERESTING COLLECTION OF MODELS.

Model making is one of the most interesting and fascinating hobbies to which a man can devote his time. Not only is a vast amount of pleasure derived therefrom, but it frequently happens that important inventions and improvements to existing machinery have been the outcome of this hobby. The boy who shows an aptitude for model-making usually possesses sufficient inventive and mechanical skill to turn out something that will make his name attain prominence in later life.

Visitors to Mr. Charles Maclurcan's wireless station at Strathfield have been greatly interested in the very fine collection of working models which makes the visit doubly attractive.

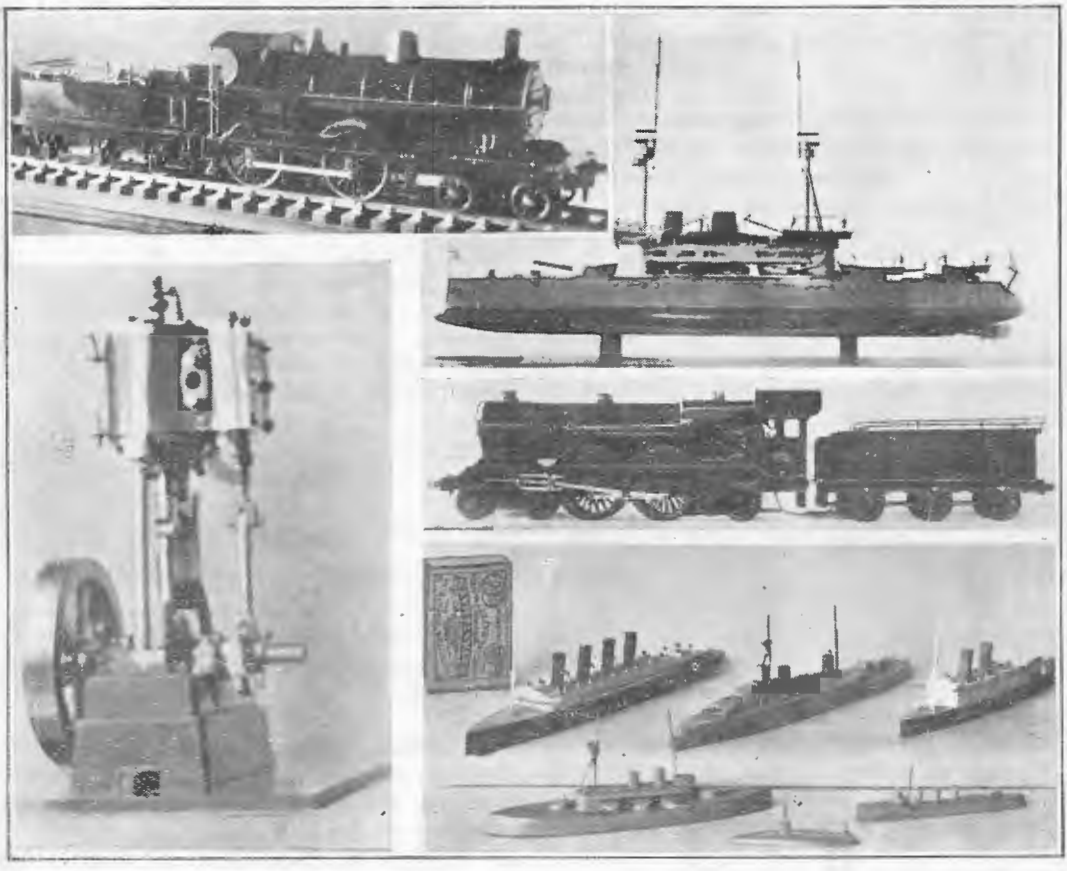
Wireless is by no means Mr. Maclurcan's only hobby, and model-making has always had a fascination for him. The models described here are all scale working models, and, with the exception of the *Lord Nelson* and tiny ships, were made while Mr. Maclurcan was serving his electrical engineering apprenticeship.

Vertical High-Speed Steam Engine.

This engine was designed for driving a dynamo at high-speed. It has a cylinder 1½ inches bore by 1¼ inches stroke. At 60 lbs. pressure it develops nearly ½-h.p.

London and North-Western Locomotive "Precursor."

Built to a scale of five-eighths of an inch to the foot this locomotive is 3 feet in length, and with 60 lbs. pressure of steam



Mr. Maclurcan's Models.

1. London and North-Western Loco Precursor, ⅝-in. scale. 2. $\frac{1}{10}$-in. scale model of battleship "Lord Nelson." 3. Marine type vertical steam engine. 4. ½-in.scale model North British railway loco, "Aberdonian. 5. Tiny ships, 1/100th-in. scale, s.s. "Lusitania," battle-cruiser "Lion," s.s. "Otranto," battleship "Lord Nelson," submarine and destroyer.

will haul a person of nine stone. The cylinders have a bore of $\frac{5}{8}$-inch and stroke $1\frac{1}{4}$-inch. The boiler is a loco type, with two central flues and 15 field tubes. It is fitted with a superheater coil. The tender contains the fuel and water supply. A small hand pump forces the water into the boiler, and the engine will steam continuously.

North British Railway Locomotive "Aberdonian."

This engine is quite different in construction to the "Precursor." It is built to a scale of half an inch to the foot. The outside cylinders are $\frac{1}{2}$-inch bore, 1-inch stroke. The valve gear is interesting, being a simplified modification of Joys' valve. The boiler is a water tube made of seamless copper tube, with brazed ends. It is tested to 120 lbs. per square inch pressure. The normal working pressure is 60 lbs., and a load of 50 lbs. is easily hauled. Vaporized spirit is used as fuel, the supply of which, together with the water for the boiler, is carried in the tender. The engine is painted a chocolate brown with yellow lining.

Battleship "Lord Nelson."

This is perhaps the finest of all Mr. Maclurean's models. The prototype is a pre-dreadnought of 16,500 tons displacement. It may be remembered that a sister ship, the *Agamemnon*, did good work in the Dardanelles. It is built to a scale of one-tenth of an inch to the foot, and is 4 feet 1 inch in length. A 1/6-h.p. electric motor drives the twin screws through a tiny gear box, and a speed of three knots has been attained. The hull is of soft white pine, but the superstructure and masts are of metal. The larger guns are of wood, and will both swing and elevate. The bridge fittings, such as the steering wheel, compass, engine-room, telegraphs, sidelights, searchlights, etc., are made of German silver. Some idea of the fine work in this model may be gained from the size and finish of the 3-pounder gun on the bridge. This gun stands five-eighths of an inch high. The barrel is $\frac{3}{4}$-inch long and one-sixteenth of an inch at the muzzle. It is bored down the centre, but not rifled! The four searchlights are $\frac{1}{2}$-inch high and $\frac{1}{4}$-inch diameter of mirror. The whole of the centre portion of the deck can be easily lifted out to allow of access to the motor and storage batteries. The building of this model occupied Mr. Maclurean's spare time for more than two years.

Tiny Ships.

This small fleet consists of the steamships *Lusitania* and *Otranto*, the battleship *Lord Nelson*, the battle-cruiser *Lion*, a destroyer and submarine. They are all made of wood to a scale of 1/100th of an inch to the foot. Compare them with the photo of the matchbox.

CRICKET

(*Continued from Page* 762.)

method. The use of resin is a splendid means to improve the grip, both with or without a rubber cover. Writing of oiling bats reminds me that I was once advised to rub a very small amount of oil on the blade, just enough so that it would not be noticed, before going in to bat, so that when the ball struck the bat a small portion of oil would adhere to the surface of the ball, making it slippery for the bowler to handle properly. It may possibly be a means towards an end, but there is no doubt that no matter what the end might be it certainly does not justify the means, and is not a practice worthy of recommendation.

Much to Learn.

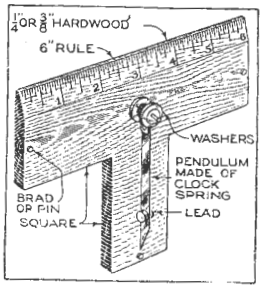
I commenced this article with the intention, as expressed at the outset, of telling you something about batting, but have discovered so many things of importance in relation to that phase of cricket that one should know before he even takes guard that I am compelled to reserve the more practical side of the question for next month's issue.

JUNIOR MECHANICS SECTION

In order to keep this section as bright and up-to-date as possible we seek the co-operation of our readers. By contributing simple constructional and experimental items—written in non-technical language that will occupy space varying from a small paragraph to a full page or more—accompanied by diagrams and illustrations, readers will materially assist. All contributions will receive our most careful consideration and, if accepted, will be paid for on publication.—Ed.

USEFUL TOOL FOR HOME MECHANICS.

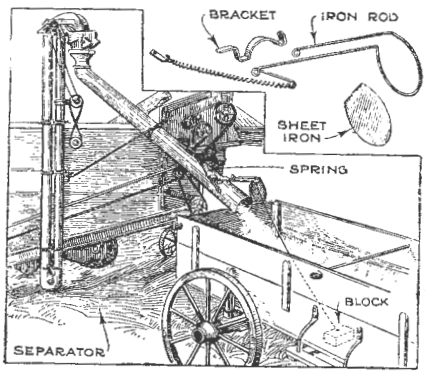
Combining a square, plumb and rule, the tool illustrated is well worth the slight time and trouble required in making it. Wood is used for the T-shaped piece, the long edge of which is graduated in inches and fractions, while the angles formed at



the corners are used as squares. The plumb consists of a pendulum, made from a piece of clock spring. Brads, or pins, are inserted at the proper points on the three ends of the device to indicate the true plumb line when using the tool to test the level of a surface.

AUTOMATIC SHUT-OFF FOR THRESHER GRAIN SPOUT.

When operating a thresher it is much more convenient to have a team hitched to each of the grain waggons than to unhitch the horses from the waggon being filled, but there are times when the horses will pull the waggon from under the grain spout before the attendant can reach them. To prevent the waste of grain that results from this an automatic cut-off for the grain spout, that operates as soon as the waggon begins to move, can easily be made. A flat iron bracket is riveted to the spout; this has upturned ears, to which the iron-road support for the shut-off is pivoted with bolts. The shut-off consists of a piece of sheet metal that closes down over the spout opening. A spring,



An Automatic Shut-Off for the Spout of a Grain Separator, That Acts as Soon as the Team Begins to Pull the Wagon Away

fastened to a hook riveted on the spout, holds the shutter up until a cord, attached to the shutter, which is tied to a 3in. square block of wood placed in the bottom of the waggon, starts the shutter to close; the spring then quickly closes it over the end of the spout. The block on the end of the spring is allowed to remain in the waggon box, and the grain covering it causes a pull when the team starts.

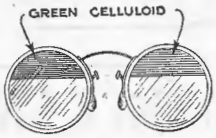
—*Popular Mechanics.*

EYE PROTECTION FOR MOTORISTS.

Motorists who are constantly reminded by aching and burning eyes of the glare of the brilliant sunlight when driving by day, or of the flash of oncoming headlights at night, have a simple remedy in the idea illustrated. Cumbersome and unsightly goggles may be dispensed with by wearing eyeglasses or spectacles having the upper portion of each lens covered with green, blue, or amber-coloured celluloid, cut to fit the lens frames. The pieces of celluloid are attached to the lenses at the rim

EDUCATIONAL ANNOUNCEMENTS

by a light application of glue. This arrangement, while protecting the eyes

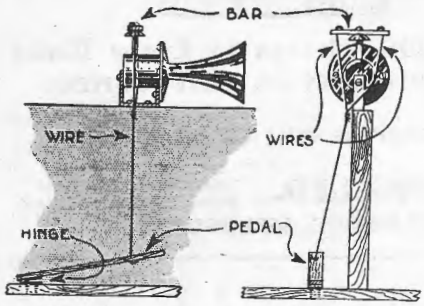


against glare, allows objects to be viewed in their natural colour.

—*T.R.H.*

MOTOR HAND HORN ARRANGED TO BE OPERATED BY THE FOOT.

Sometimes when one is driving a car all the attention must be given to driving. Where the signal horn is operated by hand this is often inconvenient, and even dangerous. There is a way to operate the horn in such emergencies.



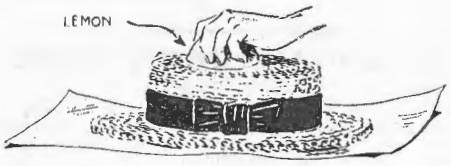
Just a Push of the Foot on the Pedal Will Operate the Horn When the Hand Cannot Be Used

Screw a metal bar across the knob on the push lever so that it points at right angles across the side of the car. Then attach two wires—one at each end—to the bar and bring them down to a pedal hinged to the door at a convenient point for the foot to reach it.

Run one wire outside the barrel of the horn and one inside, and joint them below as shown.

CLEANING A STRAW HAT WITH A LEMON.

Place the straw hat flat upon a clean sheet of white paper, after putting something under the crown to support it under pressure. Holding a half lemon as shown in illustration, rub the straw with a circular motion, exerting a little downward pressure and at the same time squeezing a little juice from the lemon. Then use a clean dry hand brush to stir the dirt loose from the straw's surface, and help the lemon juice to penetrate to the corners in the weave. Now wipe the hat dry with a clean rag. If a little care is taken it is unnecessary to remove the hat band.



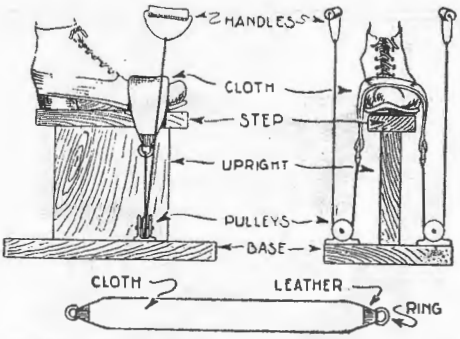
A Lemon Makes an Excellent Cleaner for a Dirty Straw Hat

SHOE POLISHER CAN BE USED WITHOUT STOOPING.

A device for polishing or cleaning the shoes so the user will not have to stoop over is herein described.

The step consists of a piece of wood 8 inches long and 3½ inches wide nailed flatwise on top of an upright 12 inches high made of 2 by 8 spruce. The upright is also spiked to a base board which may or may not be fastened to a step or the floor.

Two pulleys must then be fastened to the base, one on each side and in line with the spot where the sole of the shoe will rest on the step.



Working the Handles Up and Down Gives the Shoes a High Polish

The polishing cloth consists of a strip of heavy flannel about 4 inches wide. A leather piece at each end is used to carry a metal ring, to which is fastened a stout, flexible cord. The cords are run under the pulleys and a pair of handles are fastened to the upper ends of the cords.

The shoe is inserted under the cloth and one handle grasped in each hand. Then, by working the hands up and down, the cloth is pulled from side to side, and under as much tension as required by pulling up on the handles.