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THE OUTLOOK FOR 1919.

The outlook for 1919, on land, at sea and in the air, is particularly attractive.

On land the return of our fighting men from overseas will do much to meet the present shortage of labour, with the result that many industries, suspended because of this shortage, will soon resume their pre-war activities.

Although the opinion may not be general, we very strongly affirm that the present war, and all the conditions which go to make it, have in many cases proved a blessing in disguise.

During their prolonged exile there has awakened within the hearts of many Australasians a love for their own native lands such as no other experience could possibly have aroused.

To the present writer—who, a little to his sorrow, is not Australian-born—this universal home-sickness among the Commonwealth troops, came rather as a revelation.

Go where one would, be it Egypt, Gallipoli, the Sinai Peninsula, France, Flanders, or even in the comparative restfulness of some old-world English village, the conduct and conversation of our troops always indicated a restless longing to get back to the bush, to the sheep station, to the broad, open, sun-scorched plains, or to that village, town or city which, to them, spelled HOME.

The genuineness of this yearning for home could never be doubted, nor must it be imagined for a single moment that the discontent was bred of any hardship associated with active service conditions.

To the adventurous spirit—and it is of this element that the defending armies of Australia and New Zealand were chiefly composed—the horrors and rigours of modern warfare, coupled with the unrelaxing sternness of military discipline, left our troops comparatively unruffled, while on the other hand the tremendous excitement attendant on the arrival of a home mail, must be seen to be believed.

The present writer's eyes have been opened to this state of affairs which he has personally seen enacted on five battle fronts, and with this experience as a guide we feel justified in asserting that for the Australasian soldier the word "home" holds an infinitely deeper significance than for even the more demonstrative "Tommy."

Moreover, it may be safely assumed that the returned soldier will speedily settle down to his pre-war occupation, whether it be in workshop, factory, office, or on the land.

On the sea the prospects for 1919 are no less favourable. Announcement has officially been made of the recent withdrawal of many vessels from the list of troop transports, and to this number other ships are being added almost daily.

The next few months will undoubtedly bring many developments in the Australasian Mercantile Marine. These developments will include the reopening of mail and passenger routes, the resumption of inter-State steamer trade, an augmentation of the New Zealand services and the return to these waters of many old favourites, such as the *Ulimaroa* and the *Maunganui.*

Winter travel to Northern Queensland and the Pacific Islands—always attractive to those seeking rest and recuperation—will, we expect, be restored at a comparatively early date.

Simultaneously, we may hope to see the introduction of provisional services to Singapore and the Far East, while to the Sydney-San Francisco run one may at no far distant date welcome the return of such popular trading vessels as the *Marama* and *Tahiti.*

The Vancouver service will most probably be maintained as at present by the *Niagara* and *Makura..*

We hope in our next issue to publish official statements concerning the plans for 1919 of the P. & O. and Orient mail lines, also those of the Blue Funnel, Aberdeen, White Star, New Zealand Shipping Company, Shaw, Savill and Albion, and other popular passenger lines.

Further, it is by no means unlikely that shipping companies long established in other countries may decide to extend their services to Australasia.

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In our Navy many important developments are confidently anticipated, including the entire reconstruction of the Naval Board.

The Naval Secretary informed the writer a few days ago that the Australian battleships, destroyers, and cruisers will return to home waters immediately upon release, by the British Admiralty, from service with the Imperial Fleet, and that arrangements are already well in hand for the welcome of the returning crews

Still more recently comes the cabled report of a statement in London, by Sir Joseph Cook, Minister for Navy, that our warships will shortly be overhauled and will return to Australia early in 1919.

Further, although no official announcement has yet been made, it is the general belief that a powerful British Fleet, comprising the latest types of heavy ships and other units, will shortly visit the British Dominions.

Later advices indicate that if such a tour be definitely undertaken the Fifth Battle Squadron—comprising vessels of the *Royal Sovereign* type—and a battle squadron consisting of ships of the *Queen Elizabeth* class, will participate.

That we shall shortly welcome to our shores Admiral Lord Jellicoe is definitely promised, the object of his visit being to assure for our navy the greatest possible degree of uniformity in organisation, training types and material, on lines to be followed throughout the Dominions of the Empire.

Sir Joseph Cook will, we understand, return very shortly to Australia, and is expected to arrive in time to welcome Sir Lionel Halsey, who, it is officially announced, is to come to Australia as Vice-Admiral to our Fleet.

* * * *

Certainly, no less rosy is the future in Australasia of Aviation, the development of which—in other countries—is proceeding with gigantic strides.

Of the more recent achievements and projects, the principal are summarised in another portion of this journal.

During the last few days we are advised of the formation or of the proposed formation at an early date of an International Air Board, an International Air Conference, an Air Council and an Air Ministry.

Speaking at Manchester recently, Sir William Weir, President of the British Air Council, affirmed that the best interests of civilisation would not be served by keeping civil aviation as a Government monopoly.

The Imperial Government has drafted a scheme for an International Air Board which, if approved by the Allies—to whom it has already been submitted—will

be followed by an International Air Conference to organise international flying.

Sir William Weir further stated that the navigation of an aeroplane in bad weather would soon be as simple a matter as steering a ship in similar conditions.

Already we have planes which are able to climb 10,000 feet, travel at the rate of 100 miles per hour, make a non-stop journey of 1,200 miles, alight on the sea and rise again with a full load.

A new and tremendous industry is about to be created out of the Royal Air Force, which, trained and developed in war, will put its lessons into practice for the purposes of peace and civilisation.

According to this authority the chief problems are severe navigational training, the creation of an energetic meterological service, the adoption of improved wireless telegraphy and telephony, and the introduction of a perfected system of day and night marking of landing places and aerodromes.

This would cost a lot of money, but would consummate and justify the work of the men who had given their lives in the advancement of this branch of science.

The British Air Force, which in August, 1914, consisted of 285 officers and 1853 men, to-day exceeds 30,000 officers and 260,000 men, in addition to 30,000 women and boys.

At the present moment we are unable to publish the total number of Australian and New Zealand aviators included in the above summary, the difficulty, as explained to the writer by Major J. M. Lean (Officer in Charge of Base Records, Victoria Barracks, Melbourne), being that many officers and men who had left Australia and New Zealand with infantry, artillery, and other units, had subsequently taken a course of training in aviation, and transferred into the Flying Corps or Royal Air Force.

In this connection our readers may be interested to learn that through the courtesy of the Department of Defence, a special staff has now been detailed to compile a complete record for publication in *Sea, Land and Air*, and that these details will be printed by us immediately they are made available.

* * * *

With regard to shipbuilding, we hope to publish a definite statement as to the programme for 1919, and are promised an article on this subject from the pen of Mr. W. H. Curchin, Chief Executive Officer for Commonwealth Ship Construction, which will appear in our next issue.

The fact that a contract has been placed with the Broken Hill Steel Works during the last fortnight, for the rolling of plates for eight new steel vessels, will at any rate indicate that the building of steel ships for commercial purposes will not be allowed to languish with the coming of peace.

Further, we have printed in this issue the remarks of Mr. E. A. Eva, General Manager in Australia of the Commonwealth Government line of steamers, who states that the contract for the building in America of wooden steamers and wooden motor ships will be strictly adhered to.

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Wireless telegraphy will no doubt be extended very considerably, and as soon as peace is definitely established, passengers at sea will once again be able to communicate with friends ashore and *vice versa*, and wireless will again become the popular method of transacting urgent business and conveying urgent news, besides permitting the almost instantaneous exchange of friendly greetings.

Although official announcement has not yet been made, it is distinctly probable that many of the new developments in wireless communication, which have already been foreshadowed, will be proceeded with, and this journal predicts that the day is not far distant when properly designed stations will be erected to provide direct wireless communication between the remotest part of Australasia and the heart of the British Empire.

* * * *

Quite apart from these matters, which, we believe, are of particular interest to our readers, we venture to prophesy that the dawning years will witness a world-wide development of social problems.

But we do not share the belief that these problems will entail insuperable difficulties, and are confident that they will be faced and overcome in the same practical common-sense manner as have been overcome the far weightier problems arising out of the present war.

"AUSTRALIA WILL BE THE LAST!"

THE HON. WILLIAM WEBSTER, P.M.G., ON AERIAL MAIL SERVICES

An interview, brief, but of peculiar interest to readers of *Sea, Land and Air*, took place recently between the Hon. William Webster, Postmaster-General of the Commonwealth, and the editor of this journal.

The interview was held in the Minister's room at Parliament House, Melbourne, on Friday, the 13th of December —an ominous date which in itself may have deterred a more superstitious scribe.

The following dialogue ensued:—

The Interviewer: "We should be glad, Sir, to publish an official statement regarding aerial mails."

P.M.G.: "I have no statement to make."

The Interviewer: "Much publicity has been given to the projects put forward by Mr. Reginald Lloyd, and I have this morning seen details of yet another scheme by a returned airman who proposes to establish similar services between the prinicipal cities of Australia. May I ask whether the Government is likely to co-operate with these private concerns in the transport of mails; and if so, to what extent?"

P.M.G.: "I do not intend to ask the Government to stand behind any scheme which is still 'in the air.' "

The Interviewer: "Do we understand, Sir, that the Government will wait until aviation is carried out on *terra-firma?*"

P.M.G. (*smiling*) "I'll put it another way.—Lloyd came to me some time ago with certain proposals. I told him I could not entertain them in that form, but if he cared to submit them in concrete form I would consider the matter. He did so, and I gave him my decision. I am not the sort of man who holds one opinion to-day and another to-morrow on the same subject. The whole question of aerial mails is absolutely impracticable so far as this country is concerned."

We meekly suggested that aerial mail services are already in operation in nearly every other country in the world—Germany included—and that it appeared that Australia would be the last to come into line.

Mr. Webster corrected this statement, averring that other countries had not yet definitely adopted this method of communication; they were merely *considering* it—"and that's a *very* different matter."

Unabashed, we now instanced the case of our immediate neighbour, New Zealand; whereupon Mr. Webster replied, somewhat impatiently: "That's got nothing whatever to do with Australia."

The Minister admitted, not ungrudgingly, that aero mails may be of some practical value in densely populated countries where short journeys are entailed, "but here in Australia, with our sparse population and long distances between big mailing centres, the whole position is as different as night is from day."

"You said, just now," concluded Mr. Webster, "that Australia will be the last country to encourage aerial mail services. Let me tell you that, unless I'm very much mistaken, Australia will be the last country in the world to require them. I'm not disparaging or discouraging these schemes; let the promoters go ahead and show the Government what they can do. If they succeed in what they claim—well, *then* will be the time for me to ask the Government to consider the question of cost and co-operation. At present the whole thing is experimental. Good day!"

* * * *

We have decided to print the above report, not for its news value, but because a year hence when the reader takes down his bound volume of *Sea, Land and Air* from his bookshelves, and turns back to this page in a retrospective moment, we imagine that, in the more enlightened days that are now dawning, the one-time official views reported therein will afford considerable entertainment.

FACTS TO BE CONSIDERED IN CONJUNCTION WITH THE OFFICIAL VIEWS EXPRESSED ON THE PREVIOUS PAGE.

In the United States a regular aeroplane mail service has been established between New York, Washington and Philadelphia.

In Italy a regular aeroplane mail service is now in operation between Rome and Turin.

In Austria a similar service is established between Vienna and Lemburg, effecting a saving of ten hours on the time occupied by an express train.

In Germany aero-mail and passenger services have been commenced between Berlin, Munich, Cologne, Konigsberg, and other important cities. The passenger fare is about 4s. per mile.

A Spanish shipping company has financed an aerial trans-Atlantic service. The machines, it is reported, will each carry 40 passengers, completing the journey from Spain to the United States, and *vice versa*, in 2½ days.

Both in Great Britain and in France plans for similar services are now in course of preparation. The committee recently appointed by the Imperial authorities to inquire into the possibilities of aerial transport recommends the immediate summoning of a conference for the drafting of aerial regulations.

In October, 1918, an aeroplane flew from England to Cairo.

In December, 1918, Major-General Salmond, of the Royal Air Force, accompanied by Captain Ross Smith (an Australian), flew from Cairo to Karachi (India), the journey of 2,548 miles occupying 36 hours. Five stops were made (including descents at Damascus and Bagdad).

As we go to press the cables announce the commencement of another long-distance flight, by an aeroplane carrying a crew of six, from Ipswich (England) to Karachi and Delhi.

Almost simultaneously we are advised of the safe arrival in Rome of General McEwen's Handley-Page machine on its flight from London to India.

Finally, on December 27, the Press Bureau announces that the Handley-Page aeroplane which is en route to the East, has reached Egypt. Owing to the weather the machine flew via Sicily and Malta, and stopped a night on each island.

AN ALL-AUSTRALIAN AIR SERVICE—NEW COMPANY TO BE FORMED.

Movements are now on foot to link up the various big cities of Australia by aeroplane. This will mean that Melbourne to Sydney, Melbourne to Adelaide, Sydney to Brisbane, and Melbourne to Hobart will be brought within a very few hours' flight of each other, while Melbourne and Sydney to Perth will be accomplished within less than forty hours, with passengers sleeping at night on *terra firma*.

The general idea of the whole proposal is to make this entirely self-contained in Australia; *i.e.*, financed by Australian capital, and manned by Australian personnel.

Further than that, it is confidently predicted that in the course of the next two or three years the service will be maintained and kept running by Australian machines.

The originator of the All-Australian aerial project is a returned Australian airman who has been very closely connected with all branches of aviation since 1912.

The cost of conveyance of passengers and freight will work out at about threepence per passenger per mile and one shilling per ton-mile.

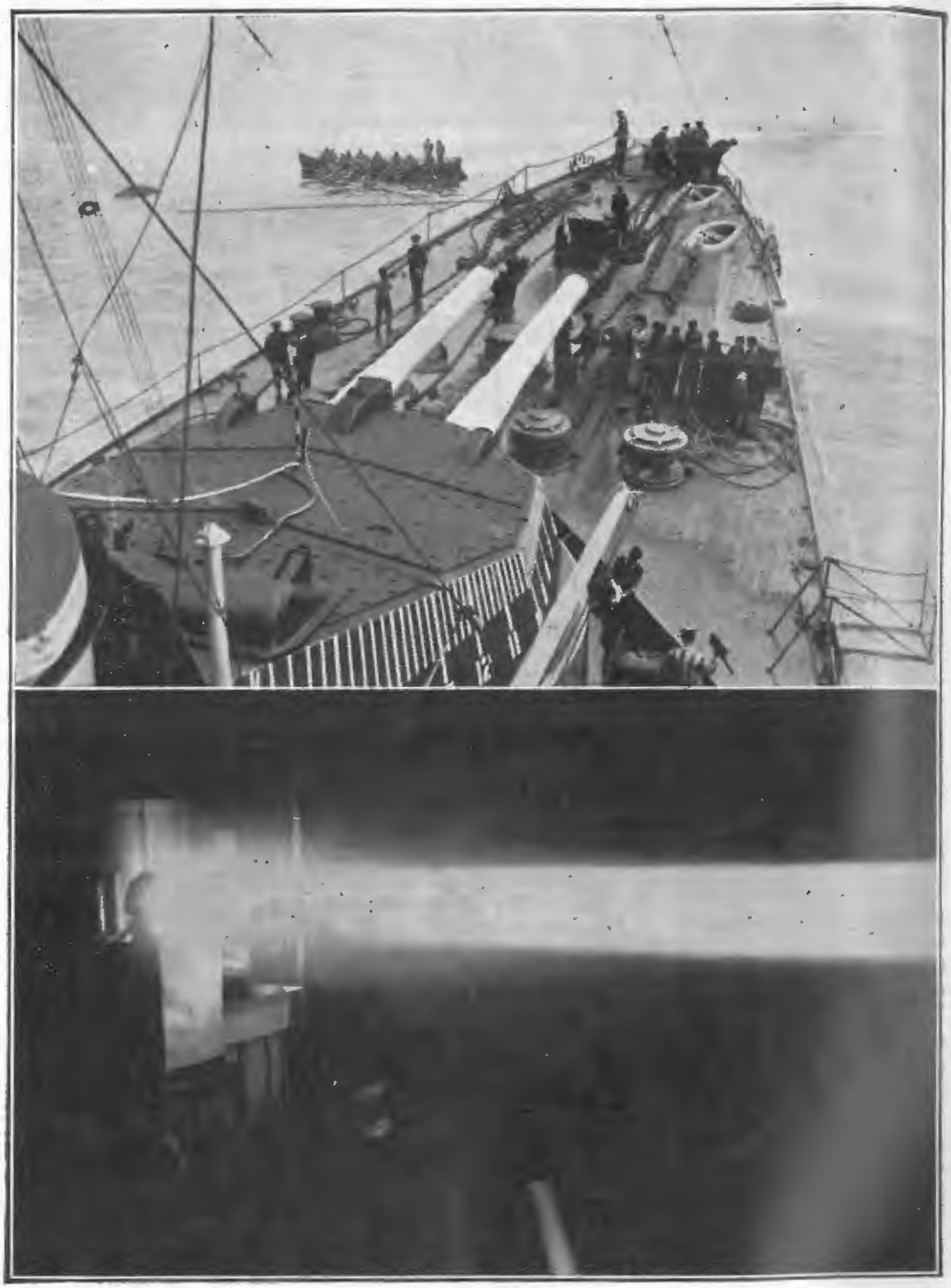
At the conclusion of certain formalities, which may not be discussed in print, but which are expected to materialise during the next few days, we hope to publish in these columns certain details of considerable interest to our readers.

H.M.A.S. Australia on Active Service.

(1) Signalling by Semaphore.

(2) Five officers who commissioned the ship five years ago. Left to right: Fleet-Surgeon Caw, R.A.N.; Lieutenant-Commander Warner, R.N.; Fleet-Paymaster Wardroper, R.N.; Engineer-Lieutenant Ross, R.A.N.; and Chaplain Gibbons, R.A.N.
These officers are known in the ship as "The Old Contemptibles."

—Admiralty Photographs (Exclusive to Sea, Land and Air), by courtesy of the Naval Secretary..



H.M.A.S. Australia on Active Service.
(1) Arriving in port after a trip. Shackling on to a buoy.
(2) A searchlight at work in a dense fog.

—Admiralty Photographs (Exclusive to Sea, Land and Air), by courtesy of the Naval Secretary.

BOUGHT AND PAID FOR—THE SHAW WIRELESS WORKS

The report of the Royal Commission on Navy and Defence Administration in regard to the purchase of the Shaw Wireless Works at Randwick, New South Wales, a copy of which has reached this journal, makes particularly unpleasant reading.

The report of the Commissioners is divided into 77 paragraphs, while the evidence taken thereat covers 94 closely printed foolscap sheets.

Six days (from November 12th to 18th) were devoted to the taking of evidence, and 26 witnesses were examined on oath. On December 9 a printed copy of the proceedings was laid upon the table of the House, and thereafter its contents became public property, and were reprinted by many sections of the Press.

As could be expected, these revelations gave rise to a considerable amount of mud-slinging, and a good deal of public comment. But comments, whether in verse, caricature, or leading article, will in no way affect a transaction which was definitely concluded as long ago as August, 1916. Moreover, the circumstances surrounding this transaction have already been fully investigated and reported upon to His Excellency the Governor-General by a Commission appointed for that specific purpose.

Of the three central participants in the sale and purchase of the Shaw Wireless Works, this journal intends to say little or nothing. Father Shaw is dead, and may not be publicly defamed; Senator Long has tendered his resignation from the Ministry, while, by withholding his own resignation, the Honourable Jens August Jensen, erstwhile Minister for Navy and later Minister for Customs, was expelled from his office by the official decree of the Governor-General.

The fact with which we are chiefly concerned is that such a sale and purchase should ever have been made possible. We are even more concerned that no similar blunder shall be made possible in the future.

In the following notes contributed under the title, "Wireless and Trouble," by one of our readers, who, we may add, occupies a high position in wireless matters, the situation seems to be presented very clearly

WIRELESS AND TROUBLE.

Ever since wireless was first introduced to Australia it has been accompanied by trouble for all connected with it.

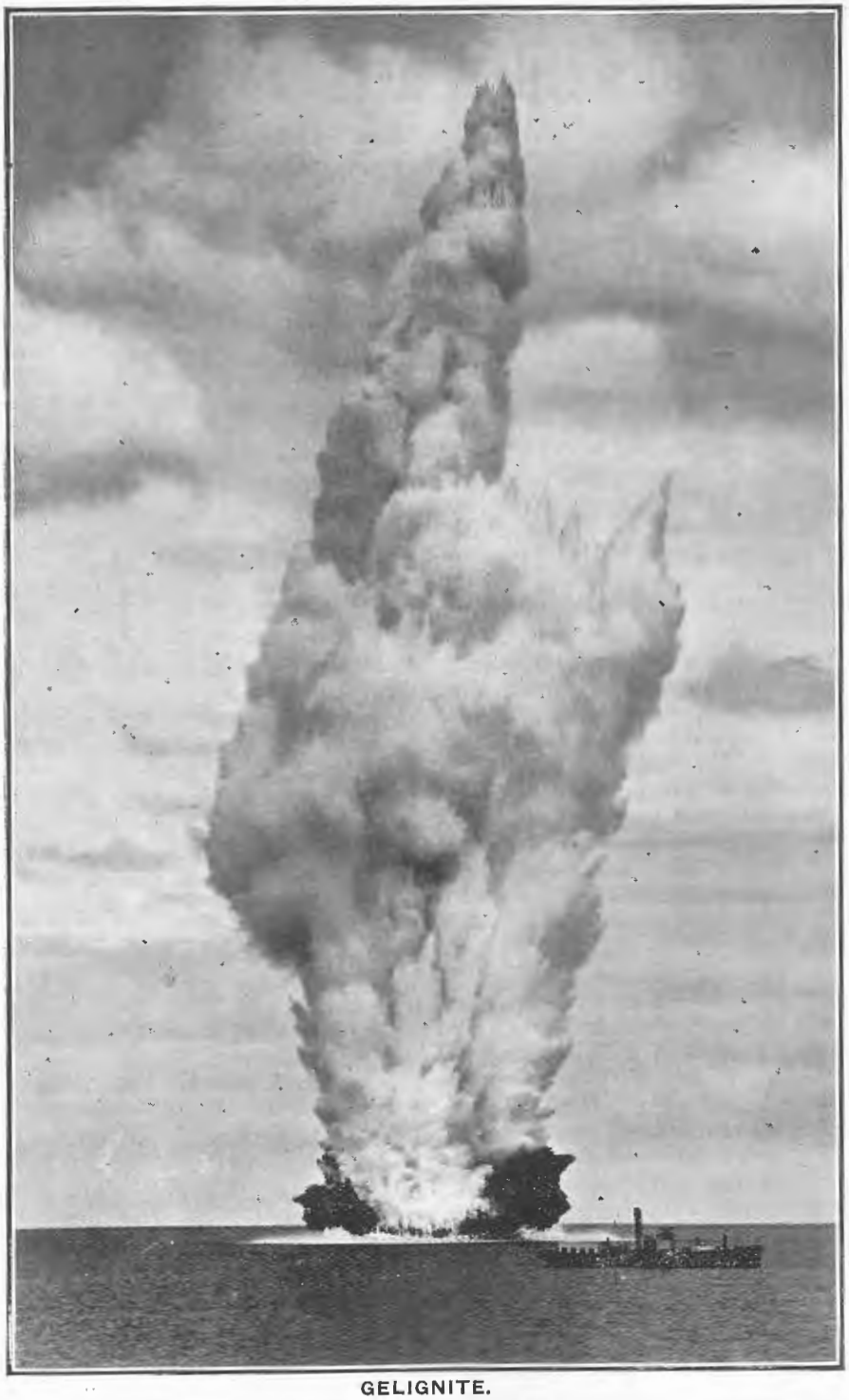
A few years ago there was the fight between a British system and a German system, which ended in German apparatus being erected at important strategic wireless stations in Australia and New Zealand by German engineers, the last of whom *returned to Berlin in the year 1914.*

After that came the long drawn-out struggle between the British system and Government, which, together with the extraordinarily high cost of the stations erected under its "own" system cost the Commonwealth far more than it would have spent in the erection of stations containing a well-known and well-proved type of British apparatus; and, moreover, the cost of maintaining and repairing the apparatus in subsequent years would have been far less.

The crowning effort was the purchase for £55,000 of a factory, which had been a notorious financial failure, and over which the directors were glad to give an option for £25,000.

If the inner history of all this were carefully examined the examiner would discover that all these troubles arose out of the encouragement of German industries and the lack of support given to British industries. If the German had been told to keep his hands off Australia he would not have been able to lay the foundations of all the troubles which have surrounded the early stages in the development of a wonderful and beneficial art.

Now that the lesson of German intrigue has been vividly impressed upon us and the Hun has been put in his place, we sincerely hope the art of wireless communication will be permitted to develop among our own people without all the sordid troubles which have hampered it in the past. There is so much to be done in the direction of both peaceful and defence development that there is room for everybody to do his best provided he is honest and provided he is British. (No others need apply.)



GELIGNITE.

In pre-war days gelignite, which had been condemned as unserviceable, would be dumped into some open waterway and destroyed. Our illustration shows the destruction in Hobson's Bay, Victoria, of 2½ tons of condemned explosives, the charge being laid in 12 feet of water.

The column thrown up by force of the explosion attained a height of 1,500 feet, the lower stratum consisting of black mud blown out of the bottom of the Bay.

Under recent regulations all condemned explosives are now utilised in the work of deepening Port Phillip Heads.

[*Photograph by courtesy of Radio-Commander F. J. Cresswell, Director of Australian Radio Services.*]

SHIPS THAT HAVE PASSED

Especially Written for "Sea, Land and Air"

BY CAPTAIN J. H. WATSON, J.P., F.R.A.H.S.

If one may judge from the speeches made at the recent laying down of the keels of vessels that are to be built in the Commonwealth of Australia, to fill the shortage of ships to carry its commerce, it would appear that the speakers, in some instances, were under the impression that they were taking a part in a ceremony which was an inaugural step in establishing a new industry. But such was not the case, for they were reviving a very old and important craft, which stern necessity, caused by the war, had compelled those in authority to undertake. Not only was New South Wales noted for its shipbuilding yards, but the timbers grown in her forests and used in construction, were among the best in the world. Sydney, the Hawkesbury, Brisbane Water, the Williams River and the Manning River, had great reputations as ship producing ports eighty years ago, and down to the period when iron and steam made shipbuilding an unpayable industry.

The First Australian-built Ship.

The first vessel laid down in New South Wales, to assist in developing our resources, was one of 185 tons, built at Sydney by James Underwood, in a yard which was entered from what is now George Street, but then known as High Street, and Sergeant-Major's Row, and situated behind the present offices of the *Bulletin*. This vessel was named the *King George*, and took the water, when launched, about where now stand the offices of Messrs. Gibbs, Bright & Co., all this portion of Pitt Street being on ground reclaimed from the Cove. This vessel was launched early in 1805, two others were built about the same time in the Cove, at the Government Dockyard, which was situated just north of the Commissariat store, on the western side of the Circular Quay. One was the Government cutter *Integrity*, of 59 tons, launched January, 1804, having taken 16 months to build; the other was a brig named *Portland*, of 160 tons. These were built to carry stores on Government account to Norfolk Island and Van Dieman's Land.

The shipbuilding industry progressed with settlement, and the next place to show signs of activity was the Hawkesbury River, where some of the largest vessels claiming Sydney as a home port, in the second and third decades of the last century, were built, near Pitt Town. Those acquainted with the river of to-day would say that it was impossible, owing to the shallowness of the water.

Captain Hunter, of H.M.S. *Sirius*, surveyed this river in 1789, and at 20 miles from the entrance, gives the depth as beween 6 and 7 fathoms. As settlement progressed, and the surface soil was broken up to put in the crops, the heavy floods which were frequent, carried the soil into the river, leaving it too shallow for anything but the smallest craft. The man who was responsible for the Hawkesbury becoming famous for the ships that were there built was John Grono, who, when he died on May 4, 1847, was interred in the old Ebenezer Church burial ground at Portland Head. This Presbyterian Church is the oldest place of worship standing in Australia, having been built in 1809. The inscription on the headstone which marks his grave, reads: "Captain John Grono, R.N." This description of a revered father was no doubt what the unsophisticated natives of the Hawkesbury thought their parent entitled to. How they arrived at this opinion can be best gathered from a sketch of his career.

Captain John Grono.

John Grono made his advent into Australia as a seaman on H.M.S. *Buffalo*, in May 1799 (not to be confounded with a

vessel of the same name which brought Captain John Hindmarsh, R.N., first Governor of South Australia, to that colony in 1836). He first comes into Australian history as being the owner of a Sydney sloop of 18 tons, named *Speedwell,* trading from the Hawkesbury with produce. Next he is heard of as among the first sealers in Bass' Straits, and on the New Zealand coast, and while in command of the schooner Governor Bligh, it is probable, as suggested by the late Dr. Robert McNab, that he named Foveaux Straits, after Lieutenant-Colonel Foveaux, the officer acting as Governor during Bligh's suspension. Captain Grono was a successful sealer and, after following that occupation for some years, he received his first land grant on the Hawkesbury, in April 1821. On this he established himself as a shipbuilder and built his first vessel, the largest up to this time built on the river. She was launched early in December, and was named *Elizabeth.* She was a brig of 130 tons, and took the water amidst "the shouts of a numerous and respectable concourse of people assembled from Windsor, and its adjoining districts."

Another vessel built there was the *Industry,* which traded on the New Zealand coast, under the command of Captain Wiseman, a son of Mr. Solomon Wiseman who kept the hotel and the ferry over the river at the place bearing his name. This vessel was lost in a gale on Stewart Island, on February 28th, 1831. Captain Wiseman's wife was a daughter of Captain Grono. Ten of the crew and six Maori women who were on board were lost, as was also the captain. A vessel of some importance in her day was launched in 1829, and named *Australian*; she was a full-rigged ship of 300 tons, and was described as the first vessel of her size wholly built out of colonial materials, and rigged with flax from New Zealand. She entered the "whale fishery" at once, and withstood the buffeting of twenty-five years in Southern waters before she disappeared from the register, being under the command of Captain Wiles the whole of that time, excepting her last voyage in 1856, when ill-health necessitated his retirement, followed shortly by the vessel being laid up, 18 months previous to the disappearance of her name.

Another vessel was laid down by Grono, on a grant that Governor Darling gave him as a reward for establishing such extensive works, and building the *Australian,* which was the largest vessel built up to the time of her construction, and although to people of to-day 300 tons seems a very small vessel, it was not so in 1831. There was also an embargo on ships of over 350 tons, which caused great irritation among the mercantile community, and it took public meetings extending over some years to remove it.

Many other vessels Grono built, but in spite of all he died a poor man. So a seaman in the Royal Navy became the captain of sailing ships, whalers and sealers, and when in the fulness of time he paid the penalty of all flesh, honoured and respected he became "Captain John Grono, R.N."

Shipbuilding at Brisbane Water.

Contiguous to the Hawkesbury is Brisbane Water (a name reminiscent of the Governor with astronomical proclivities), which in the third, fourth and fifth decades of the last century had great ambition as a scene of activity in shipbuilding, but the same cause which prevented developments in the Hawkesbury—scarcity of proper timber, and shallow water—killed shipbuilding at Brisbane Water. It is probable that the vessels built here could be counted by the hundred—none of great tonnage, certainly, but what was required at the time to carry the coastal traffic to the small harbours on the coast. Builders whose names survive are Piper in the thirties, Booth in the forties and fifties, and later Rock Davis, of Blackwall. Some of the vessels launched from this last yard will be known to many; particularly the North Shore Ferry steamer *Coomba,* launched in 1872, and the blue metal carrier s.s. *Civility* in the same year. Coming to more recent times, in 1910 the Lane Cove Ferry boat *Lady Chelmsford,* and in 1912 the steamer *Red Pine,* built for the Red Pine Steamship Company, Ltd., of New Zealand. She was 147 feet long, and her loaded draught was estimated at 9 ft. 6in., a fairly large vessel to get out of the narrow and shallow channel of Brisbane

Water. The last vessel to leave the stocks at Blackwall was the steamer *Greycliffe*, for the Watson's Bay Ferry Co., and silent and empty is that once busy spot. A visit made to it recently is responsible for a melancholy feeling which came over the writer, on entering that great shed, under whose roof activities for two generations had full sway. Excepting the men and their tools, everything was as it had been when the last-named vessel left the ways. The frame saws, rusty and dilapidated, with spare saws in the rack, travelling cranes, windlass and gear, and all the paraphernalia necessary were here. In the adjoining blacksmith's shop there were the forge, the bellows, the anvil; there were the benches with the attached vices, and various bits of metal, lying about just as if waiting for the men to pick them up and go on with the interrupted work, in fact everything was there except what Longfellow describes in "The Building of the Ship":

All around them and below,
The sound of hammers, blow on blow.

Yes, nothing disturbed the deadly silence excepting the occasional lap, lap of the water on the "ways" which ran out into it. Why such things should be seemed incomprehensible; "the oldest inhabitant," on the spot, just shrugged his shoulders.

Korff, of Coff's Harbour.

Mr. John Korff, who came to Sydney in the thirties, was a great acquisition to the port, and to the time of his death, in December, 1870, he figured largely in the shipping affairs of the port of Sydney, in which he played an important part. As his history has not previously appeared in print this seems a fitting opportunity to give a sketch of it.

John Korff no doubt was of Scandinavian origin, but was born at Hackney, in the north of London, on September 7th, 1799; later he lived at Blackwall, on the Thames, where, on December 12th, 1821, he married Mary Gordon. In the Royal Dockyard at Deptford, which is just opposite Blackwall, he worked as a shipwright, and qualified to fill the positions of shipbuilder and marine surveyor in Sydney when he arrived here in the early thirties.

The late Mr. A. B. Portus, in his "Early Australian Steamers," relates the story of the building of the steamer *Ceres* on the Williams River in 1835, and of her being fitted with engines made for her on the Clyde, of 80 horse-power. She had a brief career, for she was lost on the night of 30th August, 1836, between Broken Bay and Newcastle, foundering, after striking the rocks, in four fathoms of water.

It was now that Mr. Korff's practical knowledge came in, and having, in conjunction with Mr. Edye Manning, purchased the wreck, he set to work and got the engines and boilers out, and from the timber recovered from the hull he built, on the adjacent beach, a 61-ton cutter, and sent the engines to Sydney by her. This little craft was long known on the coast under name of *The Rover's Bride*. The boilers were made water-tight, and taken in tow, but when nearing Sydney Heads they broke loose and were never found again.

To utilise the engines, Mr. Korff built, at Raymond Terrace, the *Victoria*, in which they were placed, and this vessel was a favourite Hunter River steamer until eclipsed by the English-built steamers *Rose*, *Thistle*, and *Shamrock*, when she was sent to the East, and there sold. She was put into the Singapore and Penang trade, but interest in her ceased with her departure from Australia.

Victorian readers will perhaps be interested in a steamer which, for many years, ran as a ferry boat from Sandridge Pier to Williamstown. The writer has frequently crossed Hobson's Bay in her, over 50 years ago, when out for a Sunday morning blow. She, like the *Victoria*, was built by Mr. Korff at the Raymond Terrace yard, on the Hunter River, and her engines were made by Mr. John Struth, at his works at the foot of King Street, this being the only place in 1840 that could construct marine engines. This paddle-wheel steamer was named the *Kangaroo*, and was intended for the Parramatta River trade, in which she ran for some time. After this she had a varied career, finally settling down on the Hobson's Bay run. Possibly she is still doing duty there.

It has always been contended by the family and descendants of Mr. John Korff that he discovered what is now known as

Coff's Harbour, but which should be Korff's Harbour. It is said that he went in the ketch *Brothers*, commanded by A. Campbell, in 1847 or 1848, to the Bellinger River, and through stress of weather put into this harbour. There is probably much truth in this, but the shipping reports of the period do not help to prove it. Among the vessels that Korff & Co. built at their yard at Miller's Point in 1844 was a schooner named *Sisters*, and she went to Wide Bay on December 26, 1847, under command of Captain Campbell, with Mr. Korff as a passenger, who also returned in her to Sydney on February 27, 1848. This voyage was the first made direct to this district from Sydney. In the report of this voyage the weather conditions made it necessary to put into some ports for shelter, the names of which are given, but Coff's Harbour (or Korff's Harbour) is not mentioned. There is no trace of a schooner *Brothers* in those waters at this period, but a small schooner named *Brothers*, of 69 tons, was a regular trader between Sydney and Port Fairy, Victoria. This vessel, however, was built at Port Fairy, owned by a Mr. Griffith, and commanded by Captain Dockray. But Mr. Korff had, in 1841, built a ketch, at the Hunter River yard, of that name, and which he owned at the period referred to, but she was then trading among the islands. Why the harbour spoken of is now called Coff's Harbour there is no apparent reason, except that it is a corruption of Korff's Harbour.

About seven years ago much interesting discussion was caused by the discovery of an old trunk, or chest, in a cellar of a very old house in Queen's Court, a quaint old-world looking number of cottages laying off what is now called Dalley Street, but in the olden days Queen's Place. In this old chest were a number of dockyard drawings or plans of ships, also one of the ground plan of a section of Deptford Dockyard. But interest centred in one marked "Draught of His Majesty's Bark Endeavour." This vessel having been Captain Cook's ship when he visited this coast, led to all kinds of suggestions as to how the plan came to Sydney. From a thorough investigation of all the circumstances, extending to correspondence with gentlemen in the construction branch of the Navy, the conclusion arrived at is that these old plans are copies from the originals now in possession of the Admiralty, and had been made by a draughtsman on the spot. There seems little doubt but that they were brought out here by Mr. Korff, and formed part of his professional equipment when he was building on the Hunter River and in his yard at "Jack the Miller's Point," in Darling Harbour.

This locality was noted for its building yards; here it was that the first of the early schooners for the Richmond River trade were built by Mr. Barclay, in the forties; and in 1847 Mr. Corcoran launched *The Maid of Erin* from his yard next the gasworks.

To this spot, in the fifties, came John Cuthbert, a noted shipbuilder of his day and generation, who not only turned out many a good ship for the mercantile marine, but added to the Navy List, in 1872-3, five topsail schooners, known as Her Majesty's Ships *Alacrity*, *Beagle*, *Conflict*, *Renard* and *Sandfly*, but the first three were not launched with any of these names. The first launched was named *Nea*, the second *Eglantine*, and the third *Barham*. They were changed later when the Admiralty instructions arrived. These vessels were described as gunboats, carrying one gun, and one lieutenant commanding, one sub-lieutenant, one gunner, and twenty-five men. They were built for patrol work in the islands, for which they were absolutely useless, and were sold out of the Service in 1882-3.

Many interesting stories could be related in connection with each of these vessels, but one especially, respecting the *Beagle*, is worth reviving. She was purchased by a Mr. Mosely, of Shellharbour, in 1883, he paying £1,000 for her, and became a trader among the islands. She eventually found her way to Melbourne, and was on the list of vessels for sale. It was in June, 1891, that she was bought by "two gentlemen," said to be wealthy mining men who contemplated a cruise among the islands of the Pacific. A captain and crew were engaged, and with a full larder and a good store of creature comforts, she left on her voyage. After varied experiences she reached Callao, where her owners, said to be named Messrs. Bloom and Douglas, sold her.

But shipbuilding is the subject being dealt with, and must not be side-tracked. All the rivers to the north engaged in this good paying business, but the Williams the Manning, and the Macleay had the lion's share of orders.

Alexander Newton was building ships on the Manning in the thirties, and it may safely be said that under his own name, and later under that of Newton and Malcolm, the firm hold the palm both in the number launched and for workmanship over all competitors. The hardwood of the Manning, when put into vessels finished with copper bolts and sheathing, made vessels which have withstood the buffeting of these southern seas for 60 and 70 years.

Then Mr. Nicholson, of the same river, has vessels to his credit which, for durability held their own for long years. Who does not remember the *Fanny Fisher*, which was broken up at Folly Point in 1905, when she was close on 60 years of age, having been continuously at sea, principally in the Mauritius trade, since she was launched in 1847, having been built under the superintendence of Captain Charles Harrold, who had command of her for 11 years. About ten years ago English papers told how a small coaster had been run down and sunk by a steamer. On being brought to the surface the name on her stern, "*Benjamin Boyd*, Belfast," prompted someone to look up her record in Lloyd's Register, and there saw that she was built in Sydney in 1845. She was built, really, by Nicholson on the Manning in 1844, and launched under the name of *Triton*, sold in Sydney in 1845, and renamed after a conspicuous person in the mercantile life of Sydney at that time. She went to England that same year and never came back. She was at the time of her mishap, therefore, 64 years old, and was not considered worth repairing.

Enough has been said to show that shipbuilding is anything but a new industry, and, as its revival is begun, it is to be hoped that it may become, as there is every prospect of it so doing, the means of Australia being able to supply the means of moving her own produce.

H.M.S. "Portland," Under Construction in H.M. Dockyard at Sydney Cove, N.S.W., 1804.

OUR AMERICAN-BUILT WOODEN STEAMERS AND MOTOR SHIPS

SHIPBUILDING PROGRAMME FOR 1919.

In view of the statements recently published conderning the alleged cancellation of our shipbuilding arrangements overseas, particular interest will be attached to an official announcement made to this journal by Mr. E. A. Eva, general manager in Australia of the Commonwealth Government line of steamers.

Interviewed in Melbourne during the latter part of December, Mr. Eva informed our representative that the construction of the fleet of wooden motor steamers will be proceeded with, and that there will be no variation of the original programme.

The steamers are being built in Seattle, U.S.A., by the Patterson, MacDonald Shipbuilding Company, to the following specifications:—

Length, Over all: 281 feet 6 inches.
Beam, to Outside Planking: 48 feet.
Depth, Moulded: 27 feet.
Total Deadweight Lifting Capacity: 3,844 tons.
Cargo-lifting Deadweight Capacity: 2,959 tons.

Of this fleet two have already left the yards, *viz.*, the *Bellata* (launched 18th April, 1918, arrived at San Francisco 13th November, and departed for Australia 27th November), and the *Bundurra* (launched 25th May, 1918).

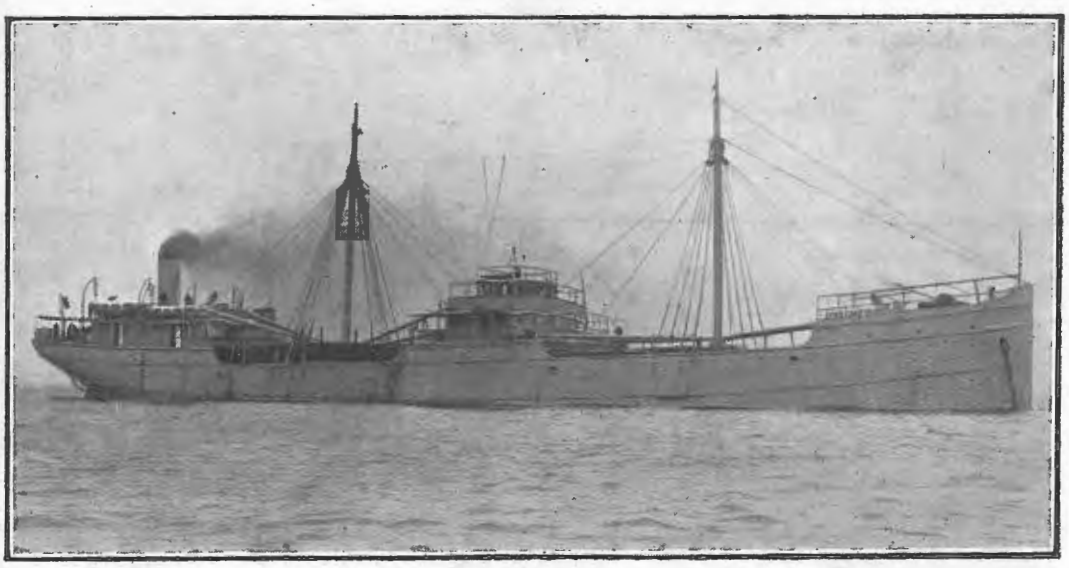
The remainder of the wooden steamers will be delivered in Australia in the undermentioned order:—

Bethanga, *Birriwa*, *Berringa*, *Benowa*, *Babinda*, *Balcatta*, *Boobyalla*, and *Boorika*.

Of these eight vessels six will be fitted with Diesel engines instead of steam, thus enabling them to carry more cargo.

The wooden motor ships—erroneously described as schooners—are four in number, *viz.*, *Cethana*, *Culburra*, *Coolcha* and *Challamba*. The three first named have already arrived in Australia, while the last is expected to conclude her maiden voyage before these lines appear in print.

The photographs of the launching of the *Bellata* and *Bundarra*, which we publish on pages 600 and 601, are reproduced by courtesy of Mr. E. A. Eva.

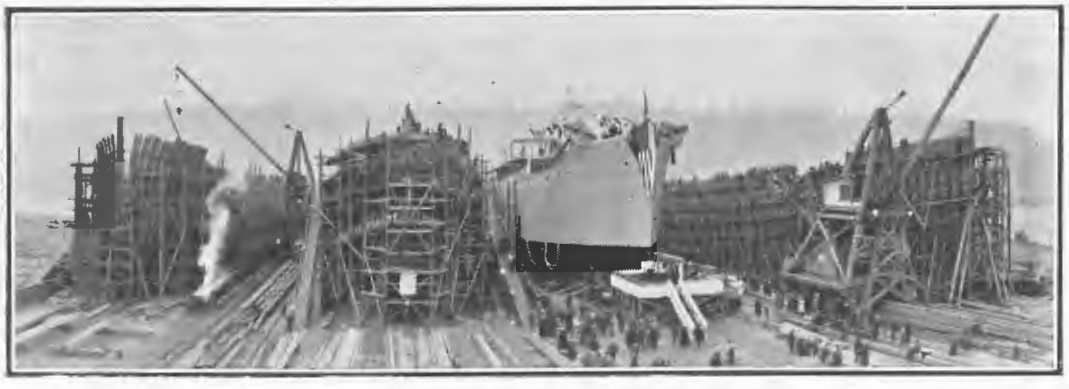


The Culburra reaches Sydney.
The *Culburra* (2,341 tons) is the second of our new fleet of American-built wooden motor-ships. She is here shown entering Port Jackson on her maiden voyage from Seattle.

Launching a Commonwealth Steamer in America.

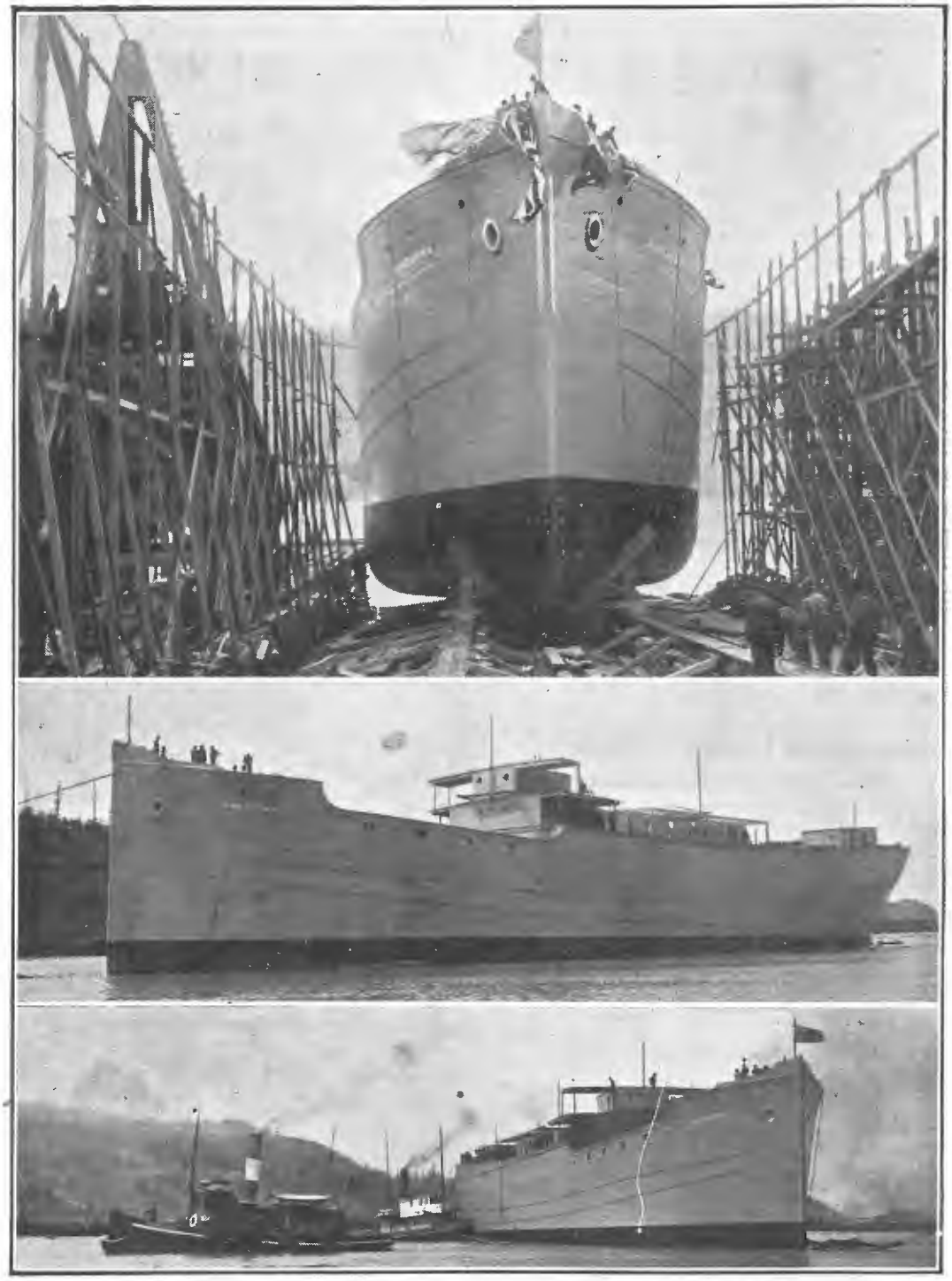
The above photograph was taken at the launching of the *Bellata* (3,844 tons, Commonwealth Government Line) at the Patterson, MacDonald Shipbuilding Yards, at Seattle, U.S.A.

The group includes the Minister for Navy, Sir Joseph Cook; the Prime Minister, Hon. William Morris Hughes with Mrs. and Miss Hughes; and Mr. Denison Miller, Governor of the Commonwealth Bank of Australia.



The "Bellata" on the Slips at Seattle.

The three vessels shown in course of construction are the *Bethanga, Birriwa* and *Berringa.*



Launching the Bundarra, 3,844 tons, Commonwealth Government Line.

(1) Leaving the ways at Seattle, Washington, and (2) and (3) at anchor in Puget Sound, U.S.A. The vessel was launched on May 25, 1918, from the yards of the Patterson, MacDonald Shipbuilding Company, Seattle.

AT THE CENTRAL FLYING SCHOOL

EDITOR OF *SEA, LAND AND AIR* GOES JOY RIDING.

The safety factor has been increased enormously. In the latest biplanes, which are fitted with two, three and even four sets of engines, one is probably as safe as, perhaps even safer than, he would be in an express train. —*Melbourne Argus*, December 14, 1918.

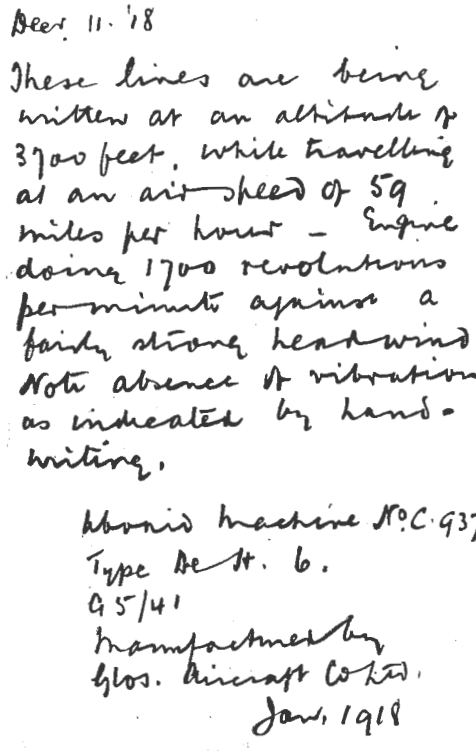
On December 11th, two days before the above lines were printed, the present writer visited the Central Flying School at Laverton, Victoria, and was taken up on two flights in the type of aeroplane referred to.

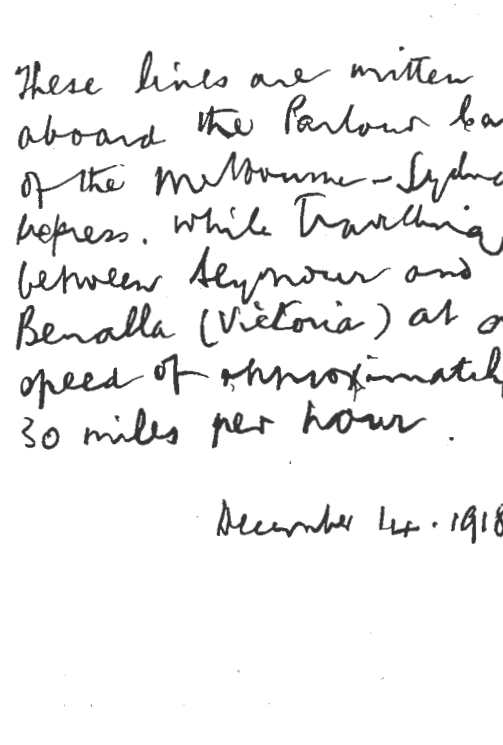
On December 14th, the date on which the above report appeared in the *Argus*, the writer made a journey in an express train.

The first journey was made at an average speed of 60 miles per hour, the second at approximately 30.

We reproduce below facsimiles taken from our notebook on both occasions, the first being written in the air on December 11, the second on December 14, while travelling under conditions which, according to the railway authorities, constitute the acme of modern comfort.

The reader is invited to compare the steadiness of the former with the jerkiness of the latter, and then decide for himself as to which of these two modes of travel would appear to be the more comfortable and which the more likely to be generally adopted in the days when both become equally possible.





(1) The "Dangerous" (?) Way. (2) The "Safe" Way.

Self-Explanatory.

By invitation from Major Lee K. Murray of the Central Flying School, and with the personal approval of Major-General J. G. Legge, C.M.G., C.B., Chief of the Commonwealth General Staff, we were permitted to ascend, both before and after luncheon, in aeroplanes reserved for instructional purposes. Both machines were of the six-cylinder De Havilland, 1918 model, constructed in England by the Gloster Aircraft Company, Limited.

The pilots of the respective flights were Captain F. E. Tregilles, A.F.C.—who, on the afternoon of our visit, ascended to a height of 10,400 feet—and Flight-Lieutenant Miller, who, two days later, accompanied by Flight-Lieutenant Oakes, commenced—under the direction of the Department of Defence—an aerial survey of the route between Melbourne and Sydney for the purpose of mapping out landing grounds and aerodromes. We are promised a copy of the completed map for reproduction in this journal some time during the coming month.

Each of the above-mentioned officers has seen considerable service, either in the Australian Flying Corps or the Royal Air Force, and are but newly returned to Australia.

In view of all that has been published concerning aviation under war conditions, and the many graphic descriptions of "the real thing" which have from time to time been contributed to *Sea, Land and Air* by recognised experts, we feel that an account of our own little excursions into the empyrean world make comparatively tame reading.

Under instructions issued by Higher Authority, we were not permitted to take part in any form of "stunting," the two flights being executed under conditions which would govern commercial aviation in peace time.

Flying against a 22-mile head wind, we occupied the observer's seat, read the instruments, surveyed the landscape and made random jottings in the editorial notebook.

Of the instruments we can write nothing which our readers have not previously had explained to them in this journal. To our left a small indicator recorded the number of revolutions per minute; to our right an altimeter registered the height attained, while above it a similar device recorded the air speed.

That the machine had been wheeled from its hangar to the ground of the aerodrome before we took our seats goes almost without saying—nor is it necessary to refer to the starting of the engine, a process somewhat akin to the cranking-up of a motor car.

To the amateur the sensation of flight is at first a trifle unreal, and unless a vigilant eye be kept upon the instruments the ascent will have begun some little while before he realises that *terra firma* has been left several hundred feet below.

So slight is the difference between taxiing across the ground at 40 miles per hour and rising from it at 60 that, to the layman at any rate, it is almost imperceptible, and certainly less alarming than the sudden upward rush of an electric or hydraulic lift in an office building.

By watching the altimeter the observant passenger will suddenly see the hitherto stationary hand glide around the dial from "Zero" to "50 feet," passing thence with great rapidity to 100, 200, 500, 1,000, 2,000 feet, and thereafter in gentler advances of 500. During the first few moments the altimeter and other instruments completely absorbed our attention, and not until Captain Tregilles had aroused us by a tap on the shoulder and a downward wave of the hand did it occur to us to take a peep over the side of the aeroplane.

We then found ourselves at a height of some 1,500 feet above the blue waters of Hobson's Bay. while to our east the fast-receding landscape had begun to appear as a huge, faintly-coloured map, the ploughed fields closely resembling a gigantic patchwork quilt, while the garnered sheaves stood out like tiny pin-heads.

Another possible disappointment to amateurs on a maiden flight is felt in the almost complete absence of that sensation of speed which one would instinctively associate with any form of aviation. The engine roars, the wind shrieks wildly past one's ears, and one recognises that the donning, on a midsummer afternoon, of a

heavy fur-lined flying-coat, a leather cap with protective ear flaps, and the regulation goggles, is not altogether compatible with the apparent immobility of the plane. Moreover, with the finger of the speed indicator wavering between 58 and 62 miles one is forced to realise that things are not quite as they seem.

Just as the albatross hovers above an ocean-going vessel, making, say 20 knots, and, while apparently motionless, continues to keep pace with the ship, so does the aeroplane fly across the heavens without any apparent change in the landscape two or three miles below it.

Only once during the two hours' flight did we appreciate something of the speed at which we were moving. Ploughing its course up Hobson's Bay in the direction of Williamstown was a large cargo vessel, which moved at a speed manifestly no greater than our own. But when our shadow darkened the surface of the water near this steamer and then literally streaked past it one experienced a little of the exhilaration of headlong flight through space.

Presently, though all too soon, our pilot, by a downward gesture of the hand and an interrogatory uplift of the eyebrows, invited us to indicate whether we had had enough. A reluctant nod of assent from ourselves, a sudden comparative silence caused by the shutting off of the engine, and the downward glide had begun.

A series of "S" turns, banking up on alternate wings, rapidly sharpened the details of the landscape, and in far less time than it takes to tell we were hovering within a few feet of the landing ground.

An almost imperceptible bump, greatly minimised by the attachment of skids and shock-absorbers to the under-carriage of the plane, and we found ourselves taxiing back towards the aerodrome, and pulling up within half a dozen feet of its wide doors.

Here the machine was taken over by waiting mechanics, and our flight was at an end.

Tea at Major Murray's cottage, presided over by his wife—newly returned from England—was followed by a motor run back to Laverton station, a distance of six miles.

* * * *

At the conclusion of the railway journey to Melbourne we encountered one of those extraordinary contrasts which go to make this world the strange place it really is. The following incident impressed us as being worthy of relating.

Immediately outside Spencer Street Station we found a large crowd assembled about a small boy. An ambulance waggon drawn up at the kerb made it clear that there had been an accident of some sort. It transpired that the boy, while cleaning the windows of a confectioner's shop, had fallen from a step-ladder and sustained internal injuries necessitating his removal to the Melbourne Hospital.

The distance from the top of the step-ladder to the pavement below did not exceed five feet.

* * * *

On the proposal forms adopted by at least one of the leading insurance companies in Australia is printed the following question: "Do you contemplate engaging in aviation?"

If the question be answered in the affirmative this company refuses to insure the would-be policy-holder against accident.

* * * *

It becomes increasingly obvious that in the public interest, no less than in their own, the principal insurance companies should take immediate steps to inquire into the risk, or otherwise, associated with peace-time aviation, and at the same time to modify some of the war-time clauses in their policies. We predict that the first insurance company to adopt a common-sense attitude towards this form of travel will write up a large amount of new business.

SYDNEY-LONDON AERIAL SERVICE

Marked activity has been shown during the past month by those connected with the Sydney-London Aerial Service.

Mr. Reginald Lloyd, under whose leadership the preliminary work is being conducted, informs this journal that the route in so far as Australia is concerned, has definitely been decided upon, and a report on the Malayan route by Mr. P. A. Anthony, general manager of the Federated Malay States Railway, is under consideration. The first landing station outside of Sydney will probably be at Nyngan in New South Wales, while Port Darwin will be the jumping off point in Australia. The route originally proposed—*i.e.*, to Cape York and thence across New Guinea—has been discarded.

Mr. Lloyd has been in regular cable communication with Mr. Handley Page, who is taking a lively interest in the doings of the Australian Company. Directors have been appointed in Sydney, Melbourne, and Adelaide, Mr. Kelso King, Mr. A. Wigram Allen, and Mr. E. Lloyd Jones being the Sydney directors, while Adelaide is represented by Mr. E. Allnutt (managing director of D. & J. Fowler, Ltd., and chairman of the Adelaide Chamber of Commerce). Mr. Fred Thoneman, one of the ablest company experts in Victoria, is the Melbourne director. Mr. A. D. Rankin, of Fell, Rankin & Morrison, chartered accountants, is the Melbourne trustee for the shareholders.

The survey party will leave Sydney on January 14, and expect to reach Darwin in from eight to nine weeks.

The Acting Prime Minister has definitely stated that generally the Commonwealth Government would place no obstacles in the way of the local movement, while the company has benefited to a considerable extent by the assistance and advice of His Excellency Sir Henry Lionel Galway, K.C.M.G., D.S.O., Governor of South Australia, and of Major-General J. Gordon Legge, C.M.G., C.B., Chief of the General Staff, Australian Military Forces.

Although it was intended at first to employ only motor cycles and side-cars, it is now probable that the survey party will include an aeroplane in its equipment.

The Vacuum Oil Co. have undertaken to keep the party supplied with petrol and oils throughout the trip, and with that object in view are making arrangements in advance of its departure.

With reasonable luck on the overland trip, Port Said or Bagdad, one or other of which places will mark the termination of the survey, should be reached within six months from the date of starting, and very little more than a year from now should elapse before the service would be inaugurated.

To Survey the Proposed Aerial Route from Sydney to Suez.
Motor cycles and side cars to be used by Mr. Reginald Lloyd's survey party, on exhibition in Martin Place, Sydney. The expedition will leave Sydney on January 14, 1919.

A PROBLEM OF PEACE.

THE WOMAN MENACE.

Especially Written for "Sea, Land and Air" by MISS KAE McDOWELL

The advance of woman into the various fields of industrial and commercial life during the last four years has been rather like the triumphal progress of an army. She has taken up many new branches of work and, as a rule, she has been successful. It must, however, be remembered that the chief reason of her success is that she has been filling a breach caused by the diversion of masculine energy into other than normal channels. Her work has been to meet demands on productiveness more stupendous than the world ever knew before. It has been proved that the appetite of war is insatiable and the making of munitions for the battle front as inexhaustible a field of occupation as the pouring of sand through a sieve. Yet it was essential to the life of the nation.

When, in August, 1914, the call of the blood sounded, and men forsook the plough for the bayonet, and the foundry mallet for the entrenching tool, the gap left in the nation's productive organisation would have been disastrous had not woman stepped forward and helped to keep the wheels of civic machinery in working order. For many years, and without her knowledge, she had been preparing herself for just this dramatic entrance on the industrial stage.

Ever since the advent of labour-saving domestic inventions large numbers of women had been seeking some new channel into which to direct their energy. Many had enrolled themselves under the banner of suffragism—some from conviction, others from the desire to escape *ennui*. Feeling the wings of latent ability they struck desperately at chains which still bound them to the old order. The extremists managed to accomplish more damage in a year than could be repaired in a generation.

Then suddenly, upon the chaos of their struggle, broke the terrible white light of war, and through the coming agony of the whole world, themselves included, they saw achievement. The hatchet of suffragism was buried and, with that spontaneity which is the soul of patriotism, they formed themselves into an army for National Service.

There was hardly an avenue of labour they did not enter, from pick-and-shovel work in the Tees shipyards, to scientific research in the Nation's laboratories. When the Armistice was signed there were more than 5,000,000 British women war-workers. In pre-war days the number of women employed industrially in Britain did not exceed 200,000, and of these the majority were to be found in the textile mills.

Of these 5,000,000 women war-workers, 800,000 were munition makers, 350,000 were otherwise engaged in Government service, 200,000 in chemical and engineering shops, and 120,000 on the land. Then there were the women civilian workers, those employed on the railways (where the engine-drivers alone were men), the post-women, tram conductresses, and hosts of others.

One of the big problems of peace then is what shall be done with all this energy and earning capacity when demobilisation takes place, and the fighting men return to civil life? The problem is one that is facing not only Great Britain; it is facing the whole world. It confronts us here in Australia, and the sooner we set about finding its solution the better.

There are thousands of women in Sydney and Melbourne and other large industrial centres who are holding down men's jobs. That is, they are occupying the positions of men who went to the war, and who, it is now certain, will shortly be coming back. When they do return, their positions must be restored to them, or we break faith with them. What then of

these capable female wage-earners who will thus be thrown out of work?

It is not reasonable to assume that more than a small proportion of them will return to domestic occupations. That adjustment will chiefly apply to the V.A.D. girl, who is not even now in receipt of a salary, and who, therefore, does not greatly affect the problem in hand.

It is also not reasonable to assume that more than a small proportion of these women will subside automatically into matrimony.

Serious industrial trouble will ensue unless the labour machinery is immediately readjusted to meet the altered conditions.

Already considerable hostility is being shown by the ordinary male worker towards the advancing host of the women industrialists. Affrighted unions are up in arms against her introduction into their charmed circle. They are asking, in effect: "How dare these capable Amazons come and snatch the bread out of our mouths?"

Still these "capable Amazons" have to live. The gloves are off, and if they are willing to go into the fight on an equality basis they must be given the equality.

There is an old adage that it is no use locking the stable door after the steed is stolen.

The steed of industrial monopoly has already been stolen from the male worker and it is merely childish for him to commence barricading his stable door at this hour.

Women have, during the unprecedented turmoil of the last four years, shown their ability for many, to them, new branches of labour. Numbers of employers, previously sceptical, now consider a woman as reliable and efficient a worker as a man. In many cases they consider her more reliable, and reliability in business is a no inconsiderable asset.

True, a business girl retains her little vanities and foibles, but, after all, it does not take her so long to dab a little powder on her nose as it used to take her male predecessor to go "over the way" for a drink.

As truly as there are many positions in which woman, in spite of her aspirations, will never reign, there are also many which men will never again hold.

It is useless to draw a curtain over the gravity of the situation. Shortsightedness, next to wilful blindness, is the world's greatest handicap.

An answer to the problem, in fact the only satisfactory answer, is in the vigorous stimulation of our industries to meet the case.

We must increase our assets, Someone said recently, speaking of the burden of coming taxation and the need of vast commercial enterprise to combat its crushing effect, that it will be only by the arduous labour and exhaustless energy of the whole community that an era of speedy post-war prosperity will be achieved.

In Australia can be grown practically every raw material that humanity needs. The material is therefore at our doors for unlimited industrial development. Thus, far from being a curse, this reinforcement of marketable energy is one of Australia's greatest assets. What she chiefly needs is the establishment of new industries and the extension of those already in existence. That, and decentralisation; so that commercial economy may be attained and the raw materials be grown practically at the factory doors.

In Nova Scotia some years ago a little group of far-seeing fisher folk spent all the money they could lay fingers on in buying up land about a certain undeveloped port. Then they presented a large block of this land, together with a deep-water frontage, tax free, to a big and progressive industrial concern, on condition that a factory be immediately established thereon. The conditions were fulfilled, and now a large and bustling manufacturing town stands where once a few fishermens' huts relieved the solitude, and many ships traverse the waters of that once-undeveloped harbour.

With bold and progressive legislation Australia will be able to turn to account the energy and skill of every man and woman in the community, and what at present appears as a budding menace may be made to blossom instead into the flower of individual and national wealth.

OBITUARY

The Late Lieutenant Geoffrey C. Scarr, R.A.F.

It is with deep regret that we announce the death, at the age of 26, of Flight-Lieutenant Geoffrey C. Scarr, of the Royal Air Force.

Lieutenant Scarr, many of whose photographs have appeared in earlier issues of this journal, was the only son of the late Mr. H. H. Scarr, manager of the City Bank of Sydney.

Our late contributor was educated at the Sydney Grammar School, and up to the time of his departure from Australia, in March, 1917, was a member of the chemical staff of the Colonial Sugar Refining Company.

Enlisting in Bombay, he was given a commission with the 12th Pioneers at Lahore, and in July sailed for Egypt, where he joined the Royal Flying Corps.

From October, 1917, until January, 1918, Lieutenant Scarr served with great distinction in Palestine. He was next drafted to England and appointed to the position of Instructor in Aerial Gunnery, at New Romney, Kent.

On November 18th last, while flying with a passenger, Lieutenant Scarr's engine failed, with results fatal not only to himself but to his passenger, the latter being killed instantaneously.

For the accompanying photograph of the late airman we are indebted to his mother, Mrs. H. H. Scarr, of Killara, New South Wales.

The Late Lieutenant Geoffrey C. Scarr, R.A.F.

AVIATION AND METEOROLOGY

Interesting Statements by Mr. D. C. Bates, Director of the Meteorological Office of New Zealand.

Mr. D. C. Bates, Director of the Meteorological Office of New Zealand, is at present on a short visit to Australia for the purpose of discussing various matters with the Commonwealth authorities. While here Mr. Bates is also seeking to arrange for the manufacture in Australia of observation balloons to be utilised in New Zealand for the purpose of meteorological tests. Despite the hurried nature of Mr. Bates' tour of the capital cities of the Commonwealth, he nonetheless found a few moments in which to give readers of this journal the benefit of his views on the necessity of a close study of meteorology by all would-be aviators.

Mr. Bates said that the coming of peace had introduced a new era in many directions, not the least of which is the world of science. History was strewn with the stories of successes and failures in battles, and in other matters which were directly the result of the effect of the weather. This lesson had been further stressed during the Great War. On both sides the armies realised the importance of weather observations for operations on land and

sea and in the air. Every four hours at the front the Generals were advised of the weather and possible direction and strength of the wind. Operations depended upon these forecasts. As indicating the importance of the weather upon warfare, he pointed out that the German fleet only escaped annihilation at the Battle of Jutland by reason of the fog, and that the enemy had entered Antwerp while their movements were similarly shrouded.

"Another instance of the importance of weather observations was provided in an unfortunate manner on the west coast of Scotland early in the war," he continued. "An aerodrome was erected at a cost of £300,000, and owing to the unsuitable conditions which prevailed the huge building had to be dismantled without a single flight having been made. All this could have been avoided if proper observations had been taken beforehand.

"Lord Montague said last year: 'It is clear that meteorology and a study of wind currents is going to be of supreme importance. The knowledge of the world's atmospheric conditions and accurate forecasts, apart from their scientific interest, may effect the saving or spending of millions of money annually when postal and commercial aviation is established."

"For a time at the beginning of the war the Germans were profiting by British weather reports in connection with the Zeppelins. It took six weeks for the authorities to realise the importance of stopping the publication of the forecasts which were being forwarded to our enemies, and eight months to prohibit the circulation of the reports at all. The immediate result of the ban, when it was enforced, was that the Germans lost two of their finest Zeppelins.

"Mr. Massey, the Premier of New Zealand, and Sir Joseph Ward have returned from abroad, fully awake to the possibilities of aerial travel, and it may be that in the future it will be possible to pay a week-end visit from the Dominion to Australia. We have two flying schools in New Zealand, which are conducted by private citizens and are achieving good results. Everybody knows the fine work which has been done by the Australian Flying Corps, and these activities will have the effect of greatly increasing the importance of our meteorological services. In this connection, it is interesting to note that Dr. Griffith Taylor, of the Commonwealth service, has given valuable instruction to the students, and Professor G. I. Taylor has been appointed to a similar position for the Royal Air Force. As indicating the importance of this instruction, Professor R. de C. Ward, of the United States, says that he who knows most about practical meteorology is the best equipped for service in the air."

Dealing with the question of season forecasts, Mr. Bates said that these could not be undertaken with any degree of confidence or success, but progress was being made steadily. Records of the past might prove the key to the future, and it was therefore a grave responsibility on Governments to see that everything possible was done to make these records as full as possible. Every time a bridge or a dam was to be constructed the engineers consulted the meteorologists, for they realised that the expediture of a few shillings might be the means of saving thousands. In collecting data voluntary observers throughout the country were of the greatest service, and they did a patriotic service often without recognition.

On the question of rain making, Mr. Bates said that it had been a common belief since the earliest times that battles produced rainfall. Plutarch mentioned this belief, and attributed it to the fact that the gods were weeping for the blood of the slain. Experiments had been carried out in Otago, when large quantities of explosives were used, but the tests proved quite futile.

"Some people think that wireless stresses will affect the clouds," said Mr. Bates. "The truth is that it has about as much effect upon the weather as the striking of a match in a room would have. The use of kites to discharge electricity in the air has not met with success in Europe and America. I am prepared to say that it is useless to attempt to cause rainfall in this way."

In conclusion, Mr. Bates said that the question of gaining accuracy in weather forecasts was making steady progress, but much remained to be done and would be accomplished in the near future.

THE SUGAR INDUSTRY

Especially Written for "Sea, Land and Air"

BY MRS. SELWYN LEWIS, B.Sc.,

Who can do without sugar? What a terrible privation it must have been to the English and to all the brave troops stationed there to have been rationed in the way they were. For sugar produces heat in the body, and heat, as we know by watching any machinery at work, produces energy.

It is due only to the energies of the cane planters who control the swarms of natives working under a blazing sun that we are now able to say "More sugar, please!"

India has always been the greatest sugar producing country in the world, about two and a half million acres of her land being under cultivation of the sugar cane, but even this is not nearly sufficient to supply the Empire, for the native, being mainly a rice-eater, requires a lot of sugar, which has a food-value equal to that of lean meat. The United States, Jamaica, Java, Fiji, and Queensland have had to work hard to meet the ever-growing requirements and to compete against the French, Austrian and German cultivation of beet sugar.

The sugar cane (*sorghum*), an enormous grass and the giant of its family, sometimes grows to the height of 15 feet. Its allies—the bamboo, Chinese cane, maize plant, and some foreign grasses—also contain a large amount of sugar.

The sugar cane grows wild in some of the fair South Sea Islands, and was probably introduced into India by some wandering race in prehistoric times.

We hear of the Indians cultivating cane sugar when the Greeks and Romans had only honey to sweeten their food with.

Fifteen hundred years ago its cultivation was confined solely to Bengal, and the little that came to Europe was very costly, and used only as a medicine.

Brought into Europe by the Moors, the cane was first planted in Spain, and by the Portuguese in the Madeira and Canary Islands; then came the discovery of the New World, and with it the introduction of sugar into new dominions.

The sugar cane has been so modified by these thousands of years of artificial cultivation that it no longer seeds, thus reproducing itself in the natural manner of all plants. Some botanists undertook to bring it back to its natural state, and the seedlings are now a botanical curiosity.

All sugar canes on a plantation are propagated from cuttings of stalks containing a bud; when these are planted the buds at the joints spring forth and a number of roots are thrown out round each joint.

Nourishment is supplied to the young plant through these roots till they are old enough to have roots of their own.

The parent cutting decays as the roots grow, and the young plants develop very quickly in the hot sunshine and well moistened by tropical showers.

Some system of irrigation is necessary in lands such as upper India, China, Mesopotamia and Egypt, where the rain does not fall in the warm sunshiny weather just when the cane most needs it.

An estate first has to be well drained then pipes laid down for irrigation in the scorching hot weather.

The soil is then reduced to a powder by much ploughing, and then the cuttings are laid in holes which are gradually filled by hand as the shoots develop.

At first there is a battle between the young canes and the weeds, then as the stalks mature the lower leaves decay and have to be removed by hand, the roots sometimes throwing up suckers which have to be cut away.

Then just when the earth is radiant with its flowing green carpet, the canes are cut with hatchets very close to the ground, tied into bundles and taken to the mill.

The roots are left in the earth and from them springs another crop of smaller canes called *ratoons*. These roots will go on producing new shoots year after year, and although their value slowly diminishes, the loss of sugar is made up by the saving in labour of planting new shoots.

In the modern sugar mill there is not one particle of waste, everything being made use of in this wonderful industry; even the woody fibre that remains when all the juice is pressed is used to feed the furnaces.

The canes from the plantations are dropped haphazard on an endless chain that carries them to three enormous rollers, one above and two below that crush the cane before it is carried on to the furnace. The engine ejects its steam after it has done its work in the cylinder, but this steam is used to boil the sugar juice. The juice extracted by the rollers is caught by the mill-bed and passes into a collecting tank. There it is strained and pumped, first through a juice heater to stop all fermentation, and then into a defalcator.

This is just like a copper surrounded by a cast-iron steam-jacket.

Milk of lime is added to neutralise the acidity of this sticky liquor, and then steam is turned into the steam-jacket to bring the juice a little below boiling-point.

Scum rises to the surface and impurities sink to the bottom. Then a plug is opened a little distance from the bottom and the partly clarified juice drawn off, leaving the scum to settle upon the dregs. These are afterwards boiled together and treated so as to yield yet more sugar. The real juice is now boiled in a copper called an eliminator, and the scum thrown up is removed.

Then the liquor stands for hours in a subsider where more dregs collect. And now the liquor is ready to be boiled to grain, that is, it has to be heated to the point at which crystallisation sets up.

The boiling vessels are arranged in a series of twos, threes and fours. The first vessel is heated by the exhaust steam from the engines used in the mill, in the last vessel a vacuum is obtained by causing the vapour evaporated in it to pass into a condenser connected with a vacuum pump.

The heat of the steam in the first vessel boils the juice there, the vapour from the boiling juice passes into the second vessel and heats the juice there to boiling point.

Then the vapour given off in the second vessel sets the juice boiling in the third apparatus.

By these and other economies the cane planters of to-day can produce 12 million tons of cane sugar a year, thus rivalling the beet manufacturers of Germany and Austria, whose united industry could only raise 6½ million tons.

All impurities are removed by treating the sugar in an enormous pan with lime and phosphoric acid. The liquid is strained and treated with animal charcoal, which has the power of removing mineral and organic bodies, and also colouring matters, and so we get at last the pure white sugar which has to be re-crystallised in a vacuum pan.

An experienced man examines the contents of the pan from time to time, until the required degree of stickiness is obtained, he then disturbs the contents by admitting more liquor, whereupon crystallisation begins.

The sugar cubes are made in the form of slabs or sticks and cut afterwards.

The cheapest sugar of all—starch sugar—is that used in the adulteration of other sugars and for the manufacture of inexpensive sweets, toffee and caramels. This quality is made by boiling starch with sulphuric acid and afterwards adding carbonate of lime.

This is a very cheap way of making glucose, quite 30 pounds of it can be got from a bushel of corn, so the cost of manufacture is only a half-penny a pound.

ANOTHER NEW AUSTRALIAN INDUSTRY

METAL MANUFACTURES, LTD.

A modern plant, for the purpose of manufacturing copper-wire, cables and busbars, has recently been installed at Port Kembla, New South Wales, by Metal Manufactures, Ltd., and is now producing raw materials of this class in large quantities. As the importation of these articles from England is now almost impossible, the new works will fill a long-felt want. The management has secured the services of experts from England, and, with a supply of raw material close at hand, is able to compete very favourably with the outside market. Orders are now being filled, and stocks of a fair magnitude are, we are informed, held in Sydney by Messrs. William Adams & Co., Ltd., who are the sole distributing agents for New South Wales.

AERIAL WEEK-ENDS

Especially Written for "Sea, Land and Air" By C. A. JEFFRIES.

One of the greatest changes brought about by this war will be that of our conception of distance. Hitherto, we have measured distance by miles because there was no standard means of locomotion by which it could be reduced to an equation of time, except in a few special railway and steamship runs. So, for ages we have gone on thinking of distance in terms of miles—which mean nothing, instead of hours and minutes, which bring home at once to the human mind a concrete fact.

Once when travelling in the Riverina, the writer asked a wayfarer how far it was to Golden Hill. He said it was about five miles. At the end of two hours' steady jogging, with an occasional canter, Golden Hill was still invisible. A passing squatter said it was fifteen minutes' canter from the first turn to the left. He proved to be correct. He measured it by time; the other had tried to imagine what five miles was.

Distance expressed in miles means practically nothing to the human mind. But everyone understands exactly what five, ten, or twenty-four hours mean.

With the coming of the aeroplane and aerial passenger traffic, we shall probably measure distance by the standard time occupied traversing it. Two hours' run will mean, roughly, 200 to 250 miles. We will think of Melbourne as a city five hours away, and not a place 550 miles distant. Brisbane will be a place about seven hours away.

With this change of thought as regards distance will come a broadening of mind and view that will work miracles in the lives and destinies of countless human beings. In Australia it will consolidate the nation, and break up any tendencies that might evolve in time to split the Continent into separate political entities. In private life its effects will begin to show themselves immediately.

. . . . . .

In few countries in the world are there so many week-enders in proportion to population as in Australia, and Sydney especially. Go where you will, Gosford, Shellharbour, Tuggerah, you will find a Sydney business man trudging along with a line and rod. In the mountains you will find him with his family in the motor car; and if you swoop down on the Pitt Water or the long reaches of Cowan Creek, you will find him in a motor launch. But the limit of them all is about 50 miles from the city. Beyond that radius they may not stray—TIME forbids.

With the coming of the Aerial Week-end all this will change mightily. The week-ender will suddenly find Melbourne as close by aeroplane as Katoomba is by rail. Kosciusko, Yarangobilly, Wombeyan and Jenolan, Shellharbour, and a thousand-and-one other places of delight suddenly become afternoon trips. The time to reach them can be comfortably counted in hours and minutes instead of days and nights. The orbit of life will have expanded enormously, and to breakfast in Sydney and lunch at mid-day in Melbourne will become a commonplace of life.

As for week-end trips, real Friday-night-to-Monday-morning jaunts, they will practically cover the half of the Continent for the man who merely wants to view things from above. Draw a circle round your home city, with a radius of 500 to 750 miles, and you have the dizzy limit in a week-end scamper. For the cost of a first-class railway fare, the Sydney denizen can in turn visit Melbourne, Adelaide, and Brisbane, and thereby get to know his Continent intimately. When he is tired of the cities he can explore other wonders, and spend Sundays in the recesses of the hitherto mysterious heart of the Continent, the Macdonnel Ranges,

or view any part in which his interest is keen.

But it is not of these far-flung dashes into other States we would write of. Rather let us concentrate our thoughts on the beautiful Saturday afternoons and Sundays we can spend by aeroplane around our own incomparable Sydney. Delightful, lazy flights at about 70 to 80 miles per hour, that we may lean back and drink in the beauties of the land over which we drift. Let us take a draught of the magic philtre of Imagination.

Saturday.

Across the Hawkesbury and Wolgan Valley to Newnes.

The great aeroplane soared from the Moore Park aerodrome, and glided over North Sydney. As it rose there unrolled beneath us the vast and wonderful aspect of mingled land and water formed by Sydney, Botany Bay, Port Jackson, and, presently, Middle Harbour. These excursion 'planes were fitted with silencers, and conversation was easy and pleasant. Smoking quietly, we looked down on the view beneath, and the great city and far-flung suburbs became a quaint fancy brilliantly set out in mosaic, in which the red roofs of Mosman, over which we were passing, made a splash of glorious red. Away towards Manly we seemed to drift, no trace of the speed of 70 miles an hour being evidenced in the distinctness of the picture that unrolled before and beneath us.

The ocean climbed over the rim of the earth's curve. Botany Bay disappeared, but in front the rugged coastline, fringed with flashing foam and brilliant ultramarine blue rolled out increasingly. Away to the north a long spear of land ran between a glittering sea of deepest sapphire on one side—the ocean—and on the other a sheet of water of soft Italian green—the Pitt Water. As we swept over the crest of Bushranger's Hill, the long rugged, Scottish-like coast of Kuringai Chase rose to view.

We glided down that long, long spear of land. It seemed to vanish in a few seconds, and Lion Island rose out of the distance, and then the great aeroplane swung westward, droned down till we could see the foam of the wavelets of the Pitt Water. We ran along the bold Scottish-looking coast, and then soared suddenly upwards, and circled round and above the pinnacles of that wild loveliness that we call Kuringai Chase, dived down, and, following the track of Cowan Creek between shores of soft Italian beauty, came out over the Hawkesbury.

Here the 'plane turned south-westward, and we rocked lightly over Pennant Hills, a painted picture on a painted earth, till the wooded heights of Kurrajong crept and then leapt into view. We rushed at that vast wooded rampart, vaulted sheer over it, and then, describing narrowing circles, entered the gorgeous vista of the Grose Valley.

Great giant cliffs of Hawkesbury sandstone, looking like the walls of huge castles in an enchanted land, loomed out in terra cotta and glorious Bartolozzi red. Immediately below the bush was green, but in the distance it ranged from the most delicate violet to deepest sapphire, and through the centre of it, winding like a soft delicately blue riband, the tortuous Grose River.

Then, sheer over the mountains—a wilderness of bush-clad hills over which we flew low, an enchanted land of wood and wold, and next, by narrowing circles over the dreary wastes of Bell, to where we came to something like a Chinese city, in which every structure was built on the pagoda plan. A deserted city without sign of life, and, as we glided over it, it gradually dawned upon us this was not a mirage, nor a pantomime. What looked like pagodas were outcrops of soft stone which had weathered away, leaving the various strata of ironstone standing out in thin but innumerable fins. It was the entrance to the wild, wonderful, brilliantly coloured Wolgan Valley.

We coasted down between giant cliffs of brilliant red, which in the distance faded into violet, and into sapphire blue. Great *massifs* stood out, strangely reminiscent of the Castle of St. Angelo in Rome, with trees waving on the battlements, and finally came to rest to spend the night on the long straight stretch of level land that leads down to the old Newnes Railway Station.

Sunday.

Sunrise in the Capertee Valley.

With the first glimmer of dawn came the rolls and coffee, and the 'plane trembled a moment, and then the clear, even glide told us we were off the ground. Between the Wolgan and Capertee Valleys rises a *massif* a thousand feet high, and a mile wide; and we were booked to see the most gorgeous sight on earth, sunrise in the Capertee Valley.

The Capertee was full of rolling clouds of mist, from which soared heavenwards long spirals in obedience to the warming of the air above by the sun rays. Then the gentle breeze rolled in to fill the vacuum, and the great veil of mist was torn to shreds through which the great 'plane sank down to within two hundred feet of the bed of the valley.

The gigantic walls of the tremendous ravine loomed majestically through the rising mist that eddied and scurried in the awakening air currents, aided not a little by the tremendous draught of our two great tractor screws. One side of the valley coast line was dull and grey; the other pink and gold.

Vast shafts of sunlight poured through the mountain gaps, and turned the gigantic cliffs to trembling masses of molten gold threatening to collapse at any second, held only in position by the grey blue masses of cliffs that still reposed in the shadow of the everlasting mountain tops.

Then suddenly the gold faded out. The sun leaped over the intervening mountains, and the gold, turning to pink and crimson, suddenly faded right out, and the picture was transformed by a single stroke into a symphony in blue and violet.

There were blue clouds—pale turquoise clouds resting against a sky of glittering sapphire blue, on which the clouds showed in faintest etching. The bush became violet immediately around, and purple in the distance, fading into invisibility in the long vista of brave distances.

Such is sunrise in the Capertee—seen from an aeroplane.

The Jenolan Caves.

Having traversed the enchanted Capertee, the 'plane soared skyward, and headed for Jenolan at one hundred and fifty miles an hour—which brought us in a few minutes to the excellent landing ground prepared by the Tourist Department.

As the aeroplane came to a standstill the breakfast bell rang, as the management never dreams of interrupting the scenic feast by serving breakfast on this run till Jenolan is reached.

After breakfast the tourists formed themselves into parties, and went to view the wonders of the Jenolan Caves. There was plenty of time, as to be seen at its best the Kanimbla Valley must be viewed in the light and shadows of sunset when the gathering shadows soften down the marks of man's handiwork.

The valleys we had hitherto seen represented primaeval nature. Now we were to pass over a garden land, a place of rich and splendid cultivation—the smoke rising on the evening air, the wonderful range of greens merging into blue and purple in the distance.

Farms and houses dotted its emerald luxuriance, veiled in blue and violet shadows, which contrasted richly with the spears of golden sunlight that stabbed between the hills, and lit wood and wold with golden, unearthly brilliance.

It faded all too soon—and *then*, the wild rush at one hundred and fifty miles an hour to reach the Sydney aerodrome before the fast-falling shades of night should make it necessary to land by artificial light. So in time we came to a grey city, dotted over with tiny sparks of light trembling uncertainly in the grey dusk, and droned down on to an aerodrome from which the landing lights shone out like vast aggregations of jewels.

Homeward, at 150 Miles Per Hour.

Then there was the flight along the coast of Northern Queensland, well beloved by the sybarites of Brisbane. The aeroplane flew low, so that the excursionists, looking down, could see the coral and other gardens of Neptune beneath the waves. On the left, the wild, wooded coast of Queensland rose like a succession of vast forest ramparts. On the right, the tumbling surf made a line of silver between the ultramarine of the dark Pacific and the deep, resplendent green of the Inside Passage.

One after another, in a long and brilliant procession, looking like giant baskets of flowers dropped on the waves, the verdant islands rose in bright succession. On, and on, till the glories of the Whitsunday Passage and Hinchinbrooke Channel were past, and the huge waterplane glided downwards and came to rest on the rocking wavelets while the excursionists dined, and then killed time till the rising of the moon for the home flight.

The home flight was a thing of terrific speed, of gleaming moonlit waves, rolling clouds, and wild, ultra-birdlike flight. When the clouds were thick the 'plane soared upward and flew headlong between their gigantic, rolling and ever changing masses. Having passed them, the wild new bird of the skies rushed down, down, down till the leaping waves reared upward to meet the charge. Then the flattening-out, the long, thrilling glide just above the phosphorescent waters, and the sheer delight of unlimited speed through a world of tumbling, gleaming waves, and a shoreline that reeled and rocked past at one hundred and fifty miles an hour, and the long, long line of opalescent and argent surf that marked the contour of the reef.

A veritable glimpse of heaven—a scrap of the Elysium to be. The Elysium that is rushing at us with headlong speed, provided we, as a nation, keep our heads, and work out our future on sane and natural lines, and eschew all short cuts to sudden wealth, realising that the safest course is along the lines that have by natural evolution led us to this last and grandest development of human genius, and made even the least of us the "Heir of All the Ages."

IN THE AIR

Especially written for *Sea, Land and Air* by Miss MYRA M. CAMPBELL.

What wonderful things we soon shall do
Now this cruel old war is really through;
And of all the glad and glorious things
The gladdest will be that we'll find our wings:

We'll order a plane as we'd call a car,
Then we'll take our seats and flutter afar;
T'will be just an everyday thing they say
To travel about in this airy way;

To play hide-and-seek 'mid the cloudlets white,
And to dip and dive in the sunset light;
We'll frolic about in the shining stars
And perhaps we shall even visit Mars.

When the pavement burns in the noontide heat
We shall take to our wings, and rest our feet.
When Life becomes dull with the daily grind
We shall mount, and—leaving dull care behind—

Our spirits shall rise as rise our machines,
And we'll learn what the joy of motion means.
Oh! we'll feel we have lived, and not in vain,
When once we have learned to handle a 'plane.

As the swallow circles in rapture free
We shall skim and float, and rejoice to see
The earth below like a picture fair,
As we sail aloft through the sun-kissed air.

'Tis said that a tight little aeroplane
Could travel to England and back again
In about ten days, and carry the mail,
And those who prefer a flight to a sail.

Oh! *such* wonderful things we soon shall do
Now this horrid old war is really through.

AUSTRALIA'S GATEWAY TO INDIA

COLOMBO'S MAGNIFICENT HARBOUR

Especially Written for "Sea, Land and Air" by FRANCIS JOHN

On the 1st of May, 1912, the then Governor of Ceylon, the late Sir Henry McCallum, R.E., officially declared open the new arm of the South-west Breakwater at Colombo, and laid a memorial stone completing one of the greatest engineering triumphs in the world; works that had gone on, without ceasing, for a period of thirty-seven years, and witnessed the rise to the position of seventh port in the world of what was previously simply a coasting port for native craft.

It may be of interest, especially since the war period began, to describe this great harbour. It is Fremantle's nearest over-sea neighbour, and a neighbour on a scale that, should Fremantle desire to emulate it, many valuable lessons will be found available for future guidance. The idea from which Ceylon's magnificent harbour has grown originated with a Governor, well known in Australia, the late Sir Hercules Robinson, afterwards Lord Rosmead, who in 1871 brought out from London Mr. R. Townsend, C.E., Superintendent of Plymouth Harbour and Breakwater, to report on the practicability of constructing a harbour at Colombo. His report was favourable, and work was actually commenced upon the scheme in 1874, when the late Mr. Kyle arrived with his staff to commence operations under the direction of the late Sir John Coode, as consulting engineer. Sir Hercules Robinson had, by this time, completed his term of office, and been succeeded by Sir William Gregory as Governor.

In December, 1875, the late King Edward VII., as Prince of Wales, laid the first block, or foundation-stone, as it may be designated, of the South-west Breakwater, which was completed in 1885 at a cost of £705,207. This scheme comprised the protection of a sheet of water 6,000 by 4,000 feet, equivalent to about 502 acres at low water. The work was completed by the Government, without the aid of a contractor, a course adopted on the urgent representations of Sir John Coode. The length of the South-west Breakwater was 3,210 feet, and it was, and is, of enormous strength, having to protect the harbour from the great rollers the south-west *monsoon* brings up during six months of the year. There was practically no harbour at Colombo 43 years ago, if a little corner at the rocky root of the land end of the South-west Breakwater, is excepted. It may seem strange to readers to-day, but it is nevertheless a fact, that the reign of the steamer had hardly begun then.

The First Steamer.

Now, the first steamer ever to anchor in Colombo Roads arrived in 1870. The roadstead was fully exposed to the fury of the S.W. monsoon, and the force, less of course, but still to be reckoned with, of the N.E. monsoon.

The delays and dangers sailing ships were exposed to, and the difficulties of discharging and embarking cargo, can be well understood by those who know the conditions in Gage Roads to-day during the S.W. monsoon months. Four years after the work on the South-west Breakwater, or in 1878, it became evident that the area sheltered by the arm would soon become unable to meet the increasing demands of shipping, so a further scheme was devised by Sir John Coode to allow the rise of what is now the northern area of the harbour. The execution of this scheme was postponed until 1893, when almost all the lines of steamers running to Calcutta, Burmah, the Far East, and Australia began, for purposes of loading and unloading cargo, as well as for bunker coal, on the outward and homeward journeys, to put in at Colombo, which, as a consequence, rapidly became a great port of call.

In that year operations began on the North-west, or Island, Breakwater, commencing 300 feet from the end of the South-west Breakwater, and the North-east Breakwater, which runs out to a point 400 feet from the other end of the island breakwater. Thus were provided two entrances to the harbour, and this work was begun from designs by Messrs. Coode, Son & Matthews, and the harbour area was consequently increased to 660 acres, or over one square mile in extent. These great and costly works were only a portion of the then general scheme, which included, beside a patent slip, of considerably greater capacity than most slips in Australia, the reclamation of a large area on the north-east side of the harbour, a great coaling depot of 24 acres, inclusive of roadways, and a storage capacity of 250,000 tons, with 18 large jetties and a barge-repairing basin of 2½ acres.

Growing Requirements of Shipping.

Later, owing to the growing requirements of shipping, it was found necessary to construct a fishery harbour. For many years it had been realised that Colombo could never take its true position as a first-class port until it had a graving dock capable of receiving the largest mercantile and war vessels able to pass through the Suez Canal. The construction of this dock, 750 feet long, was sanctioned by the Secretary of State for the Colonies in 1897, the first sod being cut by the Governor, His Excellency the Rt. Hon. Sir Joseph West Ridgeway, on March 1, 1899.

The dock was used, for the first time, in October, 1906. The Admiralty paid one moiety of the cost, the balance being met by the Colony. The harbour works, as originally designed, were now complete, but it was found that during the S.W. monsoon water at the coaling jetties was too disturbed for the efficient work of unloading deeply-laden coal lighters. To secure the necessary protection it was found advisable to run a new arm, 2,000 feet long, from the point in the South-west Breakwater where it curved in a north-easterly direction. It was this arm that His Excellency Sir Henry McCallum "opened" on May 2, 1912. It is 34 ft. wide, 30-ton concrete blocks for the most part being used in its construction. It effectually prevents the south-west breakers from rolling into the harbour. Both the South-west Breakwater and the new arm are protected by wave-breakers. These are 30-ton square blocks of concrete, dropped outside into the sea, and relieving the breakwater from much battering. No fewer than 2,500 of these massive blocks tre so employed.

Fremantle and Adelaide.

The only constructional resemblance to Fremantle or Adelaide harbours the visitor to Colombo would find would be in the North-east Breakwater. This has none of the solid masonry structure seen in the South-west and North-west Breakwaters. It is composed of rubble, backed and strengthened by heavy stones, and carrying a cylinder-supported pier to the lighthouse at the end. This mole protects the Fishery Harbour most effectively.

Growth of Trade.

Some idea of the growth of trade of the Port of Colombo may be gauged from the fact that the tonnage using it rose from nothing, comparatively speaking, in 1871, to 606,200 tons in 1877, when the benefits of the then uncompleted South-west Breakwater were beginning to make themselves felt; and to 8,919,148 tons in 1911, exclusive of coasting vessels.

Similarly the harbour revenue has expanded. It was £4,212 in 1877, and prior to the war the figures were proportionate to the steady growth of the port. Colombo furnishes an admirable object-lesson for Adelaide and Fremantle, for a large, safe and commodious harbour naturally attracts shipping. Prior to the outbreak of hostilities, Colombo, on a tonnage basis, was the fourth most important port in the British Empire, being exceeded only by London, Liverpool, and Hong Kong. Not only has it this important Imperial position, but it is, and we can use the word "is," now that peace has returned, the sixth most important port in the whole world, and the end is not yet.

Capt. John A. Legge, R.N.R., A.I.N.A., a former master attendant at Colombo, performed a highly meritorious work in the building of the new protecting arm to the South-west Breakwater, and his name will be associated for all time with

a harbour every British citizen has legitimate pride in pointing to. Captain Legge, some six years ago, prior to his retirement, in discussing with the writer the future of Colombo, as a harbour, pointed out that not so much the number of vessels but the size of them was what had to be continually kept in view. So the day may come, and indeed will, when more accommodation will have to be provided. Already there are two suggestions, or there were before the war; one for an outer harbour to cost over £3,000,000, and the other for the construction of a wet dock, on the north-east side of the harbour, an extremely costly piece of work. In the meantime, the old harbour of Galle, the calling place in Ceylon for Australians, a few decades ago, is receiving attention. A breakwater has been mentioned from Watering Point, giving shelter and accommodation to 23 ships such as called at Colombo simply for coaling and supplying purposes, and not for cargo.

Trains for India and Europe.

To aver that improvements at Colombo Harbour have reached a final stage would be foolish. We may see ere long two great jetties, 500 feet long and 200 feet broad, built out into the harbour from the south-east shore, enabling mail and passenger steamers to go alongside and discharge passengers and mails into the waiting trains for India and Europe.

This may seem, or possibly did prior to 1914, a far cry, but in reality it is not so, as the following extract from a striking speech delivered at the opening of the new arm of the South-west Breakwater by His Excellency Sir Henry McCallum on May, 1912, makes plain. His Excellency said:—"I feel as confident as I am standing here that Ceylon is still in its infancy. We have enormous areas still to open up. We have a population that is increasing from 10 to 12 per cent. every decade. We have the Manaar Railway, which will induce many South Indian people to come here. Great progress has been made during the past 20 years, and it will still continue. Colombo must be prepared to accommodate more easily a greatly increased amount of traffic than it has at present.

"I also feel confident that Colombo will be the Asian port for Australia. We have railways, at the present moment, steadily creeping forward in Western Australia. Whether the railway will continue from Baghdad to Karachi, or from Batoum to Quetta, I cannot speak definitely, but I hold that it will come. What exactly will happen is laid on the lap of the gods, but the Indian railways will be connected with the European railways, and millions are bound to come to Colombo. Before that time, I have no hesitation in saying, that you will see the railway crossing Adam's Bridge. Nature will do a good deal of the bridging work, which at first it was thought could only be done by expensive iron work.

"The Pamban railway is being laid with 5 ft. 6 in. gauge which is the gauge of the Indian railways. There may be difficulties, there may be jealousies, but the linking of the railways is bound to come—*or the mails might eventually be sent by aeroplanes.* There may be jealousy in connection with the harbour at Madras, which is being improved. But Madras, like Trincomalee, is quite out of the way of mail boats from London and Australia. Steamers could not afford the time to go to Madras, so Colombo will be the gate of Asia for Australia."

The Wide Portal.

Perhaps His Excellency might have added, after "Asia," the words, "and Europe," for a former Governor of the Colony, Sir J. West Ridgeway, once spoke of the day when Australian passengers would enter their railway carriages at Colombo and leave them at Calais. This vision will be realised, and in perhaps a shorter time than many of us deem possible. Now, what has made this wide portal to Asia possible? Why, simply men of far-sightedness and large ideas. They looked into the future, and saw the changes the Australian Trans-continental railway the linking of the Ceylon, Indian and European lines would bring about. They taught the fallacy of the tendency to limit the range of one's horizon. Had the men in Colombo in the sixties and seventies, looking over the open roadstead, crabbed their mental vision, there would have been no Colombo Harbour to-

day. Never was it so necessary as now, for those who would well serve the State in the days that are to come, to regard the future in a broad, comprehensive and statesmanlike manner.

A small belt of sea between Fremantle and Colombo but divides the Commonwealth from Europe, on its western side. How great will be the influences exerted upon our western-most port is a matter upon which it is not yet possible to speak with certainty of definiteness. There, however, remains the example of Colombo Harbour to profit by, and it is a lasting monument to British grit, brain and sinew.

WITHDAWN FROM THE TRANSPORT SERVICE

Since the signing of the Armistice the following vessels have been removed from the official list of troop transports:

Dorset, 7,630 tons—Federal and Shire Line.

Runic, 12,482 tons—White Star Line.

Boonah, 5,926 tons — Commonwealth Government Line.

Barambah, 5,923 tons, Commonwealth Government Line.

Wyreema, 6,338 tons—A.U.S.N. Company.

Zealandic, 8,090 tons—Shaw, Savill and Albion Line.

Port Darwin, 10,600 tons—Commonwealth and Dominion Line.

Marathon, 6,795 tons—Aberdeen White Star Line.

Borda, 11,000 tons—P. & O. Steam Navigation Co.

Port Lyttleton, 6,500 tons—Commonwealth and Dominion Line.

Port Sydney, 9,200 tons—Commonwealth and Dominion Line.

The withdrawals include also the *Gannet* (late *Penguin*), 208 tons, under charter to the Western Australian Government, and the *Zephyr*, 178 tons, owned by McIlwraith, McEachern Pty., Ltd.

"ANZAC" AND "ANJACK"

WANTED—A POPULAR NAME FOR OUR RETURNED SAILORS.

According to a recently cabled report, the Minister for Navy (Sir Joseph Cook) has stated that ships of the Australian Navy will return to home waters during the early part of 1919. Arrangements are well in hand for the welcome of our returning sailors. The men on arriving at home ports will be issued with liberty tickets identical with the furlough pass granted to returned soldiers, and carrying similar privileges and concessions. The majority of our lads in blue have at least three years' sea-going service to their credit, and may be regarded as the naval equivalent to the illustrious Anzac. But a different name must be found for him; a name which, besides being distinctive, will further indicate long service in foreign waters.

The Navy Department has authorised the Editor to invite readers to send their suggestions for an appropriate name, and has further expressed its willingness to adopt any appropriate title which would distinguish "the old original" from the later reinforcements.

The writer has suggested the title "Anjack," but has no doubt that many of our readers can improve upon the suggestion, and invites them to do so before the end of January.

The "Anjack," as we may temporarily call him, will on return to Australia be granted leave equivalent to 14 days for each completed year of sea service, and a further allowance for "broken periods," *i.e.*, one day for every odd month of the uncompleted year.

With regard to the probable date of the "Anjacks'" return, the decision rests entirely with the British Admiralty. We have interviewed the Acting Minister for Navy and the Naval Secretary, both of whom state that the vessels are not yet released from service with the Imperial Fleets, and that some of our war-ships are still on duty in the North Sea, Mediterranean and elsewhere.

THE WORLD'S LARGEST LOCOMOTIVES

A most remarkable feature of railway operation during the past few years has been the development of the locomotive and the production of greater hauling power in order to successfully deal with the constantly increasing traffic which is being met with by the various railways throughout the world; but particularly the American lines.

Largest Steam Locomotive.

The Virginian railway (U.S.A.) has the distinction of possessing the largest and most powerful locomotive in the world. This engine is one of ten being built by the American Locomotive Company; it is of the 2-10-10-2 Mallett type, and is capable of developing 5,040 tons horse-power. It measures 105 feet in length, weighs 449 American tons, and will operate trains weighing over 10,000 tons. Its driving wheels measure 56 inches in diameter, and its firebox is large enough to accommodate a yard shunting engine.

Largest Electric Locomotive.

Although electricity is not yet being generally adopted as a medium of locomotion, it has given the utmost satisfaction to those roads that have made use of it, and already many "electric giants" have made their appearance. The one illustrated is the largest yet built, and is designed to operate on a 11,000 volt single phase current delivered by an overhead trolley wire. It is equipped with four motors, each of which has a rating of 1,200 horse-power, thus giving a total capacity of 4,800 horse-power. This locomotive was built by the Pennsylvania Railroad at its Altoona shops, the electrical equipment being supplied by the Westinghouse people. It measures 76 feet 6¼ inches over all, weighs 250 American tons, and will haul trains of 4,000 tons at a speed of 20 miles per hour over the heavy grades of the Alleghany Mountains.

Largest Australian Locomotive.

Australia can also boast of a powerful engine, which takes a prominent place in the world of locomotives. This engine was recently constructed at the Newport workshops of the Victorian Government System, to the designs of Mr. W. M. Shannon, Chief Mechanical Engineer. It is of the 2-8-0 or "consolidation" type, has a tractive effort of 36,138 lbs., and will haul trains of 1,600 tons. It is 64 feet 6¼ inches in length, and weighs in working order 127 tons. Its construction incorporates all the most modern devices modified to suit local conditions. This class of locomotive was built specially to deal with the heavy Victorian main-line traffic, and the various test runs which the engine has accomplished have proved successful in every way. This locomotive is the largest and most powerful in Australasia, and is not outclassed by any engine of Great Britain's railways.

C. F. D.

The Largest Steam Locomotive in the World.

The Largest Electric Locomotive in the World.

The Largest and Most Powerful Locomotive in Australia.
For Description See Preceding Page.

THE GENTLE ART OF FLYING

Written for "Sea, Land & Air" by "PROP BOSS"* (Australian Flying Corps)

Although flying has grown tremendously during the last four years there are still an enormous number of people who have not very much idea of what an aeroplane is, how it is worked or how it is controlled. There have been many stories and pictures in comic papers making a joke of the time-worn remark, "What happens when your engine stops?" The following little tale may or may not have been the origin of some of these pictures.

One day towards the end of 1915 the late Major Goodden was about to test a new type of aerial gun at an aerodrome in England. Shortly before he got into the machine a sight-seeing party, who were being shown round the aerodrome, stopped to see him make the ascent. After a few minutes one of the party, a lady, said, "Tell me, what do you do if your engine stops when you are in the air?" Major Goodden looked at her for a moment or two and pointed to his gun. "You see that gun," he said, "it is kept here specially to help pilots whose engines stop when they are up in the air." The lady looked astonished, and asked him why, and what did he mean. Major Goodden then pointed to a machine which was flying over the aerodrome very high at that moment, and said, "You see that poor chap up there, his engine stopped four days ago; we have made several attempts to get food to him, but so far it has been impossible, and as a last resource I am going to shoot him down." This remark was met with blank amazement by nearly everybody present until they caught sight of the various smiles which were beginning to illuminate the mechanics' faces, and then they saw the joke. This little tale, taken for what it is worth, shows only the average mind of the individual who has had no familiarity at all with either an aeroplane or a pilot. Generally speaking, such a question as I have referred to above is not altogether absurd, and it is asked daily so many hundreds of times that it has grown to be a time-honoured phrase in aviation.

An aeroplane is almost entirely made of wood and linen braced up together by small metal fittings and wire. This construction combines both lightness and strength. The heaviest and strongest part of an aeroplane is its engine, the horse-power of which varies. The lowest horse-power that has ever been flown with is 9, when an Avro triplane ascended at Brooklands shortly before the outbreak of war. It is not an exaggeration to say that at the moment there are machines flying with several engines the horse-power of which, added together, amounts to very nearly 1,800.

The pilot's controls consist of what should be technically called a "cloche." This stick is universally mounted, giving a fore and aft control when the stick is pushed forward or pulled back, and a lateral control when the stick is pushed sideways. The machine is steered by a rudder bar, which is moved by the feet. With the exception of the rudder bar and the joy stick there are no other controls in flying on an aeroplane. The engine, naturally, has a throttle and one or two petrol taps to ensure its smooth running, but taken as a whole the total controls of both engine and aeroplane are surprisingly small.

The aeroplane itself, when passing through the air, is kept on its course by means of flaps. These flaps are divided into three headings: (1) elevators; (2) rudders; (3) ailerons. The elevator is at the end of the tail and moves up and down; it is operated by the fore and aft movement of the joy stick. For instance, when the joy stick is pulled back the elevator at the tail is raised, the pressure of the air on this raised portion tends to lower the tail and consequently raise the nose. This will obviously make the aeroplane ascend higher, also the action of pushing the joy stick forward lowers this

* "Prop Boss" is the *nom-de-plume* adopted by a returned A.F.C. airman, who still retains his high military rank and whose identity for that reason must remain anonymous.—Ed.

flap, which raises the tail, and so lowers the nose, thus enabling the aeroplane to descend. The rudder is operated by the rudder bar and the pilot's feet, and works in a similar way to the rudder of a ship. The ailerons work opposite ways; they are fitted to the extremities of the wing, and when one is lowered the other side is raised. These are worked by moving the joy stick sideways; for instance, when a machine is flying and she tilts up with the left wing down, if the joy stick is put to the right the left-hand aileron is lowered and the right-hand aileron is raised. This causes an upward pressure on the left and a downward pressure on the right, and so causes the aeroplane to assume a level position. Always when descending the engine is cut off, and the aeroplane glides down by force of gravity.

I am perfectly convinced that no man has ever yet been taught to fly. A pilot is born, not made, and the art of instruction in flying is simply a process of bringing out the individual's temperament to be able to control an aeroplane. I have known actual cases of men, who are first-class athletes, yachtsmen, horsemen, and in every way perfect specimens of humanity, but they will never fly an aeroplane. Their temperament is not of the correct sort

Vice versa, I have seen boys of 18 or 19 who cannot ride a bicycle, have no knowledge of any healthy sports, turn out magnificent pilots. The above may sound exaggeration, but any man who has been connected with aviation, and more especially with instruction in aviation, will bear me out that the above facts are true.

Another curious fact is that there are some very fine pilots in the world who are not able to fly on active service. At the beginning of the war these unfortunate men were looked upon rather askance by their friends, or so-called friends. This war has gone to show that a man is not a coward who cannot fly on active service. I think I am right in saying that one of the finest pilots the world has ever seen is unable to fly under active service conditions. This, again, is simply a question of temperament. Certainly to a given point it is a question of a man's pluck, to sit over the German lines and be shot at for minutes and hours on end without being able to retaliate, but is not necessarily a question of sheer cowardice on the part of a man who cannot do that.

The following are a couple of little tales, looking on the more or less lighter side of the flying world.

At the beginning of 1916 I was sent to the north of England to test an aeroplane which was the first made by a certain firm. It was a gala day to everybody concerned. The whole works had a holiday, and I think 90 per cent. of the inhabitants collected at the small flying ground to see the tests. To give the whole afternoon an elegant touch the works' brass band, consisting of some 30 performers, turned out and discoursed music during the greater part of the afternoon. There was a little difficulty in getting the engine to start, and I was becoming rather annoyed, since it was getting darker, and as all the people had turned out and the works had been given a holiday, it seemed rather a shame not to go up. My temper was not improved by the kind of music that was emanating from the little group of men in blue and gold, consisting chiefly of songs like "Onward, Christian Soldiers," "There is a Happy Land," etc. At last, unable to bear it any longer, I walked over to the bandmaster, easily recognisable from the remainder by the enormous quantity of gold on his uniform and by his obvious ability to stow away large quantities of beer, and said to him, "Look, will you play us something with a swing, a ragtime, or something like that." He looked me up and down for a minute or two, then shaking himself like a very angry fowl, he said, "No, my band only plays good music."

Another experience which fell to my lot, was once having to take a lady, who was somewhat of a tomboy, up for the especial purpose of looping the loop. She had been up on several occasions before, and I knew that she was no novice in the art of flying, but at the same time I was rather against looping with her. Whether it was her persuasive manner or her charming smile I have never been able to decide, but nevertheless I eventually consented. With the exception of my own flying cap and goggles there were no others for her to put on, but she discarded the cap and fixed the goggles loosely round her head. After we had been in the air about ten minutes she turned round and made signs to me to loop the loop. Accordingly I proceeded to do so. First I

pushed the nose of the machine down, so as to gain sufficient momentum to get round the circle; then I pulled the nose up and we started on our merry course. Unfortunately, at this moment my passenger disappeared into her cockpit, which was just in front of me, and I could not see her. By this time we were almost vertical and just beginning to go over on our back, but frightened there was something the matter with my passenger I pushed the machine out level without turning upside-down. I cannot tell you my feelings when, after flying level for a minute or two, her head did not reappear, and I made sure she had fainted. I shut off my engine and descended as quickly as ever I could, and on landing was greeted by a very tousled mop and a cheery smile from my passenger, who appeared like a jack in a box out of the cockpit. What had happened was this. She had put on my goggles without my flying cap, consequently they were not very tight, and the wind had blown them off, so she slid on to the floor of the machine to get out of the wind to readjust them, and before she had done this of course I was on the ground, as that part of it only took a very few seconds. That afternoon, as I said goodbye to her father and herself, she said to me, "Thank you very much for the loop." I hadn't the pluck to tell her that she hadn't gone over.

THE CONCRETE SHIP PROVES SUCCESSFUL

In a recent issue of this journal we published an account of the launching in America of the first 5,000-ton cargo vessel *Faith*.

Readers may recall that the Hon. A. J. Poynton, Acting Minister for Navy and Minister for Shipbuilding, expressed at that time some doubt as to whether concrete vessels of comparatively heavy burden could successfully withstand ocean stresses.

According to information recently cabled from New York, the *Faith*, after a successful voyage from California to Chile with a cargo of two million feet of timber, has returned to the United States carrying four thousand tons of nitrate from South America.

While it is unlikely that under the altered conditions the building of concrete ships will ever attain the popularity of steel vessels, it is nonetheless interesting to read that the shortage of material arising from wartime contingencies has been thus successfully overcome.

AUSTRIA-HUNGARY.

Especially written for *Sea, Land and Air* by HAROLD JOHNSON.

Austria possesses a unique interest and importance in the history of the world. Its historic *rôle* has been determined by its geographical situation.

Founded over a thousand years ago by Charlemagne as a defence of his empire against the Slavs, Austria——whether mark, duchy, archduchy, or empire—has fulfilled that *rôle*. Standing sentinel over the valley of the Middle Danube, Austria stopped the advance on Germany first of the Slavs, then that of the Hungarians, and lastly that of the Turks.

The name Austria is the Latin form of the German "Oesterreich," which means the "Kingdom of the East," and was so named because of its position to the east of Germany. The name was applied to the mark founded by Charlemagne at the beginning of the ninth century, and which was only of small size, forming part of the present province of Lower Austria, but this mark was the nucleus around which have been grouped all the lands forming the Austrian Empire.

The history of Austria is unique, for it is not the history of a nation so much as the history of the Hapsburg dynasty. The formation, growth, and continued existence of the power of the House of Austria is one of the most remarkable events in the history of the world.

The cradle of the Imperial House of Austria stands on the banks of the river Aar, in Switzerland. The word Hapsburg is supposed to be a corruption of "Habischburg," which means "The Castle of Vultures." Thus the castle gave its name to the powerful family which has had a continuous existence for more than nine centuries. The castle is now in ruins and the power of the family has apparently passed away.

We all well remember that the Archduke Francis Ferdinand, the heir to the throne of the Hapsburgs, whilst on a visit to Serajevo with his wife to attend the manœuvres of the Austro-Hungarian Army, which were held in Bosnia, was fired upon by an assassin, and both he and his wife were killed. This act was made the occasion to declare war against Serbia, which step kindled the great European conflagration.

Nobody in his senses believes that Europe was thrown into a convulsion because the heir-presumptive to the throne of Austria was murdered at Serajevo. This event was tragic and deplorable, but it was merely a spark that by ill luck happened to fall upon a heap of combustibles and set it in a blaze.

Great events do not spring from small causes, though more often than not they have some trivial beginning. Historians in future will probably assign to Kati Schratt, the daughter of a well-to-do Viennese merchant, a woman who held sway over Francis Joseph II. for almost 45 years, and who is regarded as having been the counsellor of the old Emperor, a prominent place in history. She was obsessed by an almost insane hatred of all things Serbian. An idolised only brother of hers was assassinated in one of the periodical Serbian upheavals. The Balkan States, like the South American Republics, suffer from a chronic affliction in the shape of revolutionary rashes.

The cause of the war lies far deeper than the murder of the heir-presumptive to the Austrian throne or the hatred of the Serbians by the mistress of the late Austrian Emperor. It is clear that Austria wanted war, not this war certainly, but a snug little war with a troublesome little neighbour, the outcome of which, with the ring kept clear, there could be no possibility of doubt.

There is little doubt that Austria was used by Germany merely as an agent who was not unwilling to stir up strife, but was only half conscious of the nature and dimensions of the contest which was bound to follow. At the eleventh hour Austria appears suddenly to have realised for herself the appalling nature of the catastrophe which impended. The present generation will probably never know what happened, but by some means or other the intrigues of the war Cabal at Vienna were unmasked. In hot haste

Austria opened discussions with Russia, but on July 31st, 1914, Germany suddenly intervened with ultimatums to France and Russia of a kind to which only one answer was possible.

The curious who wonder why the Austrians should have been such willing agents of Germany are reminded that it has always been the policy of the former nation to seek aggrandisement and expansion at the expense of smaller neighbours. One comparatively recent historical event will no doubt be sufficient to quote, as it was the foundation stone of the great war. By the treaty of Berlin (July, 1878), where Beaconsfield and Lord Salisbury played so prominent a part, Austria was authorised to undertake the occupation and administration of the provinces of Bosnia and Herzegovinia. It was agreed that the occupation should be only provisional, but 30 years later, in 1908, Austria annexed both provinces at a time when Russia, after her losses in the Russo-Japanese war, was unable to intervene. Such national crimes inevitably bring disaster to the aggressor.

It is interesting to contemplate the reason why the power founded by Rudolph of Hapsburg, in the thirteenth century, lasted until our own day. Certainly one of the principal causes was the inclusion within its dominions of the whole of the Hungarian nation. Although in 1867 Hungary became an independent country under the dual monarchy, this compromise was agreed to to satisfy the aspirations of the Hungarian people. The Emperor Francis Joseph was crowned King of Hungary in that year at Budapest, the present Hungarian capital, according to the old ceremonials, and the reconciliation between the Hapsburgs and the Hungarians was as complete as it could ever be.

Budapest is the twin-capital of Hungary. Buda is on the right bank and Pest on the left bank of the River Danube. At the time of Maria Theresa, who ascended the Hungarian throne in 1740, Pressburg was the capital. This place is now known as Pozsony, a town on the River Danube, 35 miles east of Vienna.

In olden times Austria looked more to diplomacy than arms to extend and consolidate her dominions, and of all the weapons in the diplomatic armoury she found none more profitable than marriage. By marriage the Hapsburgs acquired Bohemia and Hungary, and the matrimonial alliances with the reigning families of the two latter nations did more than anything else to consolidate the Austrian Monarchy. The Bohemians lost their independence in 1620, after revolting against the oppression of Ferdinand II., who was hated in Bohemia for his injustice to the people of that nation.

It would take too long to narrate even the principal events in the long history of Austria and the important stages in her evolution from an insignificant border mark into one of the Great Powers of Europe, as her history is not that of a single nation possessing one language, literature, religion and aspiration. but the gradual evolution under one Government of many nationalities bound together by their commmon allegiance to the reigning dynasty. At this stage in the world's history one or two interesting facts, however, may be recalled which, with the passing of time, have probably been forgotten.

At the end of the thirty years' war in 1648, the Peace of Westphalia was concluded, and Alsace was ceded to France. In 1736 Lorraine was ceded to France in exchange for Tuscany. Germany stole both the provinces from France after the Franco-Prussian war in 1871, but the present war will mean their re-transference back to France. Evidently it would be a good thing if nations as well as individuals, instead of merely remembering the phrase learnt the truth of the commandment, "Thou shalt not steal." The recent telegraphic press advice that the Allies do not intend to retain any portion of German soil points to the conclusion that Allied statesmen are going to avoid similar mistakes, although it will be a most difficult task to define frontiers with justice to all nations.

The Triple Alliance, formed in 1887, between Germany, Austria and Italy, which claimed to be a league of peace, and which ultimately brought about, if not an alliance, at least a very cordial understanding between Great Britain, France and Russia, could not be expected to hold together in the light of Austria's treatment of Italy in the past. The declaration of neutrality by Italy when the European war com-

menced, followed by Italy joining the Entente, proves how insecure were the bonds which held the Triple Alliance together.

Napoleon the Great was the first to recognise that the Italians were capable of self-government, and he paved the way for a United Italy, which has never forgotten and never will forget what she owes to him. If this is a rather general statement, let us remember that Napoleon was crowned King of Italy at Milan, and committed the Vice-royalty to the excellent government of Eugene Beauharnais, his step-son. After the victory of Austerlitz, by the Treaty of Pressburg, Venice Friuli, Istria, and Dalmatia were joined to the Kingdom of Italy.

Napoleon's firstborn son received the title of King of Rome. If a second son had been born to him he would probably have founded a line of Italian kings. The bright prospect for the future of Italy was destroyed by the defeat of Napoleon in Russia and his final fall at Waterloo.

The policy of the Treaty of Vienna was to reverse everything which Napoleon had done, or had desired to do; to reward his enemies and to punish his friends. The Vienna Congress sat from September, 1814, to June, 1815, and settled the delimitation of the territories of the various European nations. After the subjugation of Napoleon, Ceylon, Mauritious, Cape Colony, Heligoland and Malta were ceded to England. France was not permitted to hold more territory than she possessed at the outbreak of the Revolution in 1789. Austria took Northern Italy, Russia, Poland; and Prussia part of Saxony.

Although many changes, both of policy and frontiers, have taken place since that time, it must be remembered that Italy remained neutral when war broke out between Prussia and France in 1870. Italy's sympathies were most probably with the French, but the former had to remain neutral or face war with Austria, who, after her defeat by Prussia at Sadowa, in 1866, was courted as a friend by Bismarck. Perhaps the Entente statesmen were not so much concerned about the attitude Italy would take up in the Great War in the light of past history.

To the writer, history has always had a fascination. Destiny will run its course, and history presents to us some wonderful pictures.

The Turks, whose barbarities to subject races have caused such indignation throughout the world, appeared at one time as if they would over-run Europe. They had penetrated so far north as Vienna, which city they besieged in 1683. Mohammed IV. advanced from Belgrade with 200,000 men, drove back the small Imperial army and invested the city itself. After a two-months' defence the city was relieved by an army led by John Sobieski, of Poland, and Prince Charles.

The Turks were, however, not driven back beyond the borders of Austria until 1697, when Prince Eugene, of Savoy (who gained a great reputation as a military leader even in an age which was thrilled by the exploits of the brilliant English General Marlborough) gained a crowning victory against the Turks at Zenta.

Europe under Mohammedanism would have been treated exactly as the Turks have treated the Armenians.

Austria appears to have reached the limit to which she could reasonably have expected to expand, during the nineteenth century, when she had the misfortune to see established on her borders strong national States, such as a united Germany and a united Italy, an independent Serbia and an independent Roumania.

After 1867, and especially after the victory of Prussia over France, in 1870, the foreign policy of Austria underwent a change. Driven from Germany and Italy, she decided that her proper sphere of activity was in the Balkan Peninsula. But in the Balkans she met her old enemy Russia.

The relations between Austria and Russia became very strained during the Serbia-Bulgarian war in 1885, and in the face of subsequent events it is curious that it was Austria that saved Serbia from the victorious armies of Bulgaria.

Since the advent of the Karageorgevitch dynasty to the throne of Serbia, in 1903, the relations with Serbia became more and more strained. The ideal of the Bosnians and Herzegovinians was the creation of a Greater Serbia by detaching those provinces from Austria. As long as Bosnia and Herzegovina did not belong to the Hapsburg monarchy these hopes could perhaps be realised. But once incorpor-

ated with Austria the realisation of a Greater Serbia under a national dynasty at Belgrade became almost impossible. A Greater Serbia meant an effective bar against the expansion of Austria in the Balkan Peninsula and the defeat of the whole of her policy since 1870.

The result of the Balkan wars of 1912 and 1913, which greatly increased the territory of Serbia, was a bitter disappointment to Austria. The opposing interests of Austria and Russia threatened several times to produce a European war before all the questions resulting from the Balkan wars could be settled.

Immediately after the assassination of the Archduke, Austria accused the Serbian Government of not taking adequate steps for stopping the agitation in favour of the Greater Serbia movement, and demanded a declaration that stringent measures would be taken for its suppression in future. Serbia accepted most of the demands in the ultimatum, and proposed to submit the others to arbitration, which Austria considered unsatisfactory.

The insatiable ambition of the Austrian Royal House has been the cause of its downfall in the same way as the insatiable ambition of the Hohenzollerns has been the ruin of that House. May the Imperial Royal House of England:

Sustained by counsels wise and just
And guarded by a people's trust,

reign in peace and prosperity when the Hapsburgs and Hohenzollerns are forgotten.

A FALLING GLASS

Especially written for *Sea, Land and Air* by
STANLEY O. BATT, T.S.S. *Mocraki.*

Mother Carey's Chicks are gay,
As around our stern they play.
Little fluttering balls of brown
White splashed, sparkling up and down.
Wheeling high the albatross
Seem to hail impending loss
Proud their poise, and full of grace,
As they wait the gale to face.
Long and evenly the swell
Rolls our ship. and tolls our bell,—
Mother Ocean's heaving breast
By the distant storm caressed.
See the cloudy squadrons forming
In dull skies, so bright this morning!
Light scud, whipping past in glee,
Whisper of the gale to be.
Sea and sky together dress
In an oily ugliness.

* * * *

From the poop the watchful mate
Cons his vessel's gear:
Watching busy sailors flake
Brace and halliard clear.
See! The "Old Man" comes on deck,
Gazing up and down;
Well he knows the tempest's beck,—
"Time to snug her down!"

WHY AEROPLANES FLY

Why does an aeroplane fly? The scientific formula is: "Because lift overcomes gravity and thrust overcomes drift." But it may be put in simpler fashion, says an expert. Think of a boy's kite. The string is fastened to the bottom surface a little in front of the centre, while the tail is attached to the rear. Therefore the air meets the kite at an angle; it strikes on the bottom surface and forces the kite upward. Something similar happens when a gust of wind gets under an umbrella. The planes are attached to an aeroplane at an angle so that the wind gets underneath and forces them upward.

One must, however, have "thrust." That is to say, the planes must meet the air with force. In the case of the boy's kite or the umbrella this thrust is provided by the wind working against the string of the kite or the owner's hold on the umbrella. In the case of an aeroplane it is provided by the engine, which drives the propeller round and forces the machine forward.

It has been found that this top-lift is increased if the planes are made to curve downward from front to rear. This curve is called "cambre." If one looks sideways at an aeroplane one can easily see this curve of the planes.

AUSTRALIA'S PRICELESS HERITAGE—IRON

ITS CONVERSION INTO STEEL

PART III.

(Concluded from December issue.)

In the two previous instalments of this article we have traced the steel plate (from which our ships are built) from ore-bed to quarry, from quarry to seaboard, from steamer at Port Pirie, South Australia, to the Broken Hill Steel Company's unloading wharves at Port Waratah. Here we have explained, in their proper sequence, the discharge of the raw materials, the feeding and tapping of the blast furnace, and the conversion of the molten iron into molten steel. Further, we have described the processes whereby the "steel soup" is drawn off from the open-hearth steel furnaces and moulded into ingots. In the concluding paragraph of the last issue of this journal we showed the red-hot steel ingot on the approach table about to be submitted to the final process of rolling into plates. In its present form the ingot is known as a "bloom," its dimensions, before rolling, being 6 feet in length by about 8 inches wide and 8 inches high.

Rolling the Steel Into Plates.

Electrically controlled levers now guide the bloom between huge rollers, propelling the glowing mass back and forth until after some 36 "passes" its thickness is reduced to 4 inches, similarly its length increases to about 16 feet, and its width to 2 feet 6 inches.

It next travels onwards along the rolling tables to an electrically driven guillotine or "shears." The shearing machine is driven by a 125 h.p. motor. An enormous blade, descending upon the travelling bloom, slices it into three sections, at the same time lopping off the ragged edges. The dimensions of these sections or slabs are as follow: Length, 5 feet; width, 2 feet 6 inches; thickness, 4 inches.

The ragged edges drop automatically into a pit beneath the guillotine, and are carried, still aglow, by conveyor-belt to charging boxes and thence, in due course, back to the floor of the open-hearth furnace house, where they now become raw material and form part of a "charge" for the steel furnace.

Simultaneously the newly guillotined slabs return to the soaking pit, and are reheated prior to being finally rolled into plates.

On its second journey along the approach table the slab is turned lengthwise, the 5 ft. *length* now becoming the 5 ft. *width* of the plate, which is rolled out to 20 feet wide, while its former thickness of 4 inches decreases to three-eights of an inch. Similarly, the erstwhile width now becomes the 2 ft. 6 in. length, and is rolled out to about 15 feet.

When the standard dimensions, *i.e.*, 20 feet wide by 15 feet long by ⅜ of an inch thick, have been attained, the finished plate passes out at the far end of the rolling mills, and is trucked away to the stockyard.

Testing.

But no plate leaves the premises until it has been completely tested, marked and passed through the plate-shears, which cut and trim it to the requisite size.

In concluding the tests a strip, some 10 inches long by 3 inches wide, is cut from each finished plate and submitted to various chemical and other processes.

First comes the bending test, under hydraulic pressure, which is conducted in the following manner. The specimen strip of steel is laid, horizontally, across duplicate rollers, set 3½ inches apart. The aperture between these rollers is covered by a perpendicular testing-bar, which, by hydraulic pressure, equivalent to 600 lbs. to the square inch, is forced down (on a 15-inch stroke) upon that portion of the specimen which lies across the space between the rollers. If too brittle the specimen will break. The mechanic in charge of this testing machine stated that although the number of tests sometimes exceeds 500 daily, there have been not more than three breaks since the apparatus was first installed.

The specimen, of course, bends, and, under the tremendous pressure, continues to bend until the two ends of the strip of steel, once horizontal, finally rise upwards and form the letter "U."

Next comes the elongation test, under which a second specimen, cut from the same plate, is subjected to a tensile strain equivalent to 30 tons to the square inch.

The object of this test is to determine the strength of the plate, which must be capable of a certain clearly defined degree of elongation.

The minimum percentage of elongation essential in each plate that leaves the Steel Works is 20 per cent. The specimen which we were permitted to watch in the process of testing, was stretched from 8 inches long to 10.38 inches, thus attaining an additional length of 2.38 inches before snapping at breaking strain, and an elongation of 29.7 per cent.

While the irreducible minimum is, as previously stated, 20 per cent., we were informed that actual tests never fall below 25 per cent.

No visit to the Broken Hill Steel Works would be complete without a peep into the pathological laboratory, for, as the chief chemist explained, the chemical and physical qualities of the metal go hand in hand.

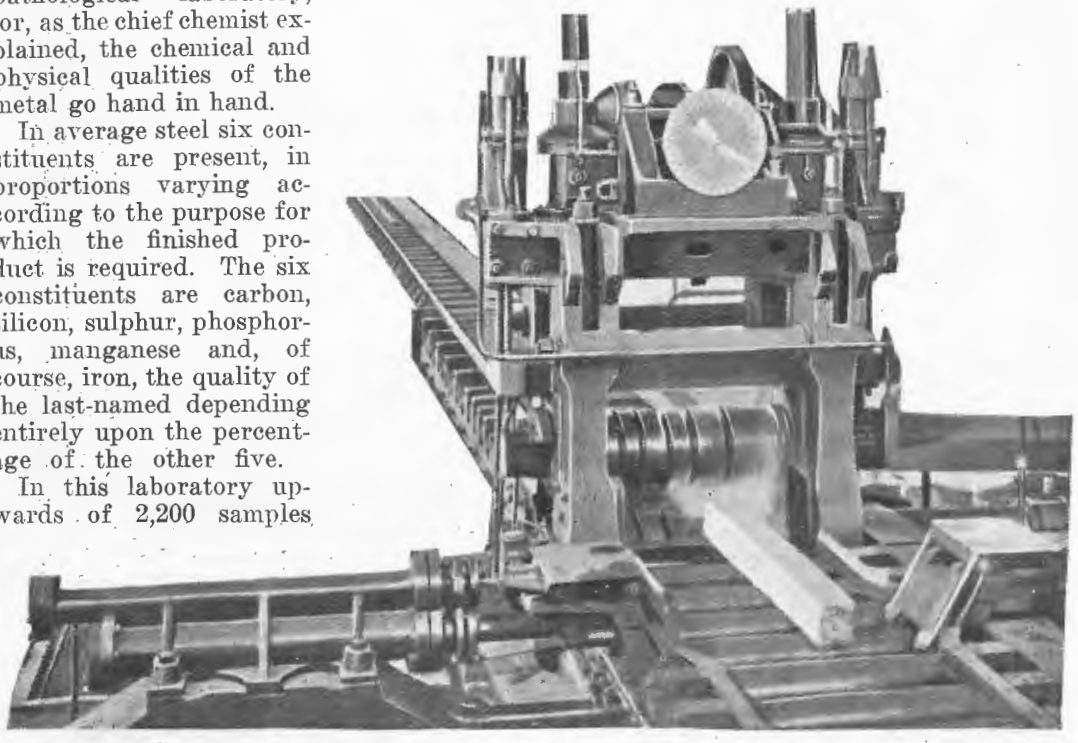
In average steel six constituents are present, in proportions varying according to the purpose for which the finished product is required. The six constituents are carbon, silicon, sulphur, phosphorus, manganese and, of course, iron, the quality of the last-named depending entirely upon the percentage of the other five.

In this laboratory upwards of 2,200 samples are tested each week, and as an illustration of the need for strict accuracy in analysis it may be stated that each Government, in calling for the supply of steel rails, insists on a different chemical specification. These specifications in every case demand that the steel shall contain less than .04 per cent. impurities (*i.e.*, sulphur and phosphorus), and with Australian ores these requirements can quite easily be met.

Within the short space of 40 minutes the skilled chemist is able to estimate the relative proportions in the six constituents in any specimen of steel. These must be tested between the time of tapping the open-hearth steel furnace and the rolling of the bloom. Meanwhile, the steel is fully analysed, and the mill manager enabled to issue instructions as to which particular section it shall be rolled into. —whether steel plates, rails, rods or drawn wire.

* * *

If there be some point connected with the manufacture of steel in Australia which we have failed to make quite clear, the reader is cordially invited to communicate with the Editor, who will be pleased to answer any question on this subject.



Rolling the Steel "Bloom."

IN THE WIRELESS HOUSE

Especially Written for "Sea, Land and Air" by ARTHUR RUSSELL

It was midnight. In fear and trembling the young wireless operator entered his little cabin. It was the first time he had been called upon to take up the duty by himself.

He had looked forward to this moment; had longed for it with mixed feelings of anxiety and exultation. And now the time had come.

With the exception of the waves, which sounded ghostlike as they played on the side of the vessel, and the faint hum of the wind as it whistled mournfully and eerily through the aerial wires, everything was silent.

He shook, but not with cold.

With the delicate receivers in his hand, he sat, hesitating, as it were, on the verge of his entry to a new world.

Many times before he had listened to those signals, but it had been in the daylight, with the senior operator in attendance.

But now he was alone—at midnight.

He forced himself to don the headgear. A multitude of sounds immediately met his ear. Strange whisperings flashed hither and thither. He listened intently, the strain making his heart-beats seem almost audible.

The messages from afar grew more insistent; his new world seemed filled with them. He became frightened. How dare he, a mere mortal, trespass in such a domain? What right had he to affront so shattering a power with his puny efforts? It was marvellous. He had no visible connection with anywhere, yet multitudinous fragments of messages seemed to flit all round him.

He was isolated—wholly alone, yet it seemed that he was surrounded by ghostly footsteps. Would his brain stand the strain, or would he go mad, he wondered.

He moved some switches, and a fresh vision unfolded itself before him. All the other mysterious voices of the ether were erased, and new ones filled their place. It was like a huge living book, the pages of which he was slowly turning. What would the next page bring forth? It might even ——.

He could hear miscellaneous messages relating to a heterogeneous number of things being flashed here and there.

What was that? The lad hastily turned several switches, threw over his aerials from the "receiving" to the "sending" side, and frantically worked his key.

His Great Trial had come, and he was equal to the occasion.

Out to the officer of the watch he raced, brimful of the startling information he had drawn from the air; then back to his instruments, armed with instructions.

All his previous lonely thoughts were forgotten. He was not a mortal entering another world, he was a wireless telegraphist, who at the crucial moment had risen to the occasion.

The perspiration streamed from him, yet he went about his work methodically and well, all his thoughts centred on the one object.

"S.O.S., S.O.S." The young fellow listened to that dreadful cry of a ship in distress. "Lat. —, Long. —." He had noted it all down, and, thanks to his efforts, his vessel was steaming rapidly to the rescue.

A few hours later relief had been given, and the great steamer had resumed her proper course.

Worn out, the young operator retired to rest, the compliments of his Captain still ringing in his ears. He was no longer a frightened boy; in those few hours he had developed into a man. Never again would the mysteries of the ether hold him enthralled. He had fought, and emerged from the fray—a conqueror.

LETTERS TO THE EDITOR

The Editor, *Sea, Land and Air.*
Dear Sir,—

At a meeting of the Committee held on the 13th inst., it was decided to make your publication, *Sea, Land and Air*, the official journal of the Australian Aero Club.

Yours faithfully,
H. J. SLEEMAN,
Honorary Secretary.
Australian Aero Club,
Melbourne, 17th December, 1918.

The Editor, *Sea, Land and Air.*
Dear Sir,—

You may be interested to hear that when I interviewed the Governor of South Australia, he said that he considered he knew a good deal about me, having read an article which referred to me in *Sea, Land and Air.*

Yours faithfully,
REGINALD LLOYD,
Manager Director, Aerial Services, Ltd. (in course of registration),
Sydney.
December 9, 1918.

The Editor, *Sea, Land and Air.*
Dear Sir,

I beg to thank you for the notice in the December issue of *Sea, Land and Air*, which will be invaluable in assisting this School to attain its object, that of becoming widely known.

The facts are, in the main, correct. I would like to point out, however, that I do not, nor have I at any time pretended to be one of the legions of claimants of the honour of being the last to leave Gallipoli, but merely of being amongst the last shipload, a very different proposition. The ship in which I left was the *Prince Abbas*, which sailed from Anzac just before daylight on Sunday, 26th December, 1915.

As I would not like it to be thought that I had made any statement which was incorrect I should esteem it a favour if some remark to the above effect could be published in the subsequent issue, or if an alteration could be made in further editions of the present issue.

Once more thanking you for the favour shown, I am,

Yours most sincerely,
H. FIRTH,
Superintendent.
The Marconi School of Wireless,
422-424 Little Collins Street,
Melbourne, 16th December, 1918.

Corrigendum.

In a brief biographical sketch of Mr. (ex-lieutenant) H. Firth, which appeared in our last issue, and to which the above letter refers, we inadvertently stated:—

> "He now took charge of the 4th Brigade Signalling Squadron, **and* was the last to leave Gallipoli at the evacuation."

We hasten to explain that the word **and* was a misprint for *which.—Ed.*

EDITORIAL ANNOUNCEMENT

Arrangements have been made for the continuation during 1919 of the series of popular articles on Wireless Telegraphy which have appeared in these columns during the previous year.

Future articles will be written in a manner interesting to readers who have no previous knowledge of wireless technique, and in whom a clearer understanding of this mysterious science will be cultivated from month to month.

RETURN OF AN EXILE

The following cable has been received in Sydney by Amalgamated Wireless (Australasia) Ltd., from the Belgian Marconi Company:—

"Pleased inform you our head office, Brussels, recommence work 1st January. Kindly address all correspondence there from that date.

"Please accept expression our warmest thanks for your assistance during our long exile."

BYE-BYE STATIC!

Especially written for *Sea, Land and Air.*

By ALBERT DEANE, Radio Station, Garden Island, New South Wales.

So we're bidding farewell to the static,
At least, so the cables proclaim,
And I'm sure that we're not very sorry,
At saying good-bye to the same.

Yes, I'll warrant there'll be no regretting,
The absence of sparkle and fizz,
Of the curse of the strong atmospheric,
The one thing that makes life a "miz."

For, thanks to a modern inventor,
A man whom we thank from our hearts,
We may soon read a message entirely,
Instead of receiving just parts.

And the bulbs and the crystals will thank him,
The motor will join in the throng,
And the gear will in gen'ral be grateful
Upon hearing the static's "Swan Song."

And not very far in the future,
As messages flash through the sky,
We'll hear, far less frequent than now'days,
The much-used request, "Please IMI."

So our thanks go to you, *Mr. Weagant,
In return for a service profound,
We send our "congrats" for discovering,
A cure that just *had* to be found.

[*The recent discovery by Mr. Roy A. Weagant was described in the last issue of this journal.—*Ed.*]

EPIDEMIC SHUTS DOWN WIRELESS STATION IN TAHITI.

The Telegraph Department advises that owing to the influenza epidemic, Papeete notifies that it is unable to work the wireless station, and therefore messages for Papeete cannot be accepted until further notice.

Jack's Day in Brisbane.

A model of the Hospital Ship *Kyarra* (recently torpedoed in the English Channel) formed a picturesque feature of the above procession. The vessel is manned by members of the staff of Messrs. MacDonald, Hamilton & Co., Brisbane.

Cool, Calm and Collect—ing.

A group of assistants at Wireless House (Sydney) War Chest Day Stall. The amount collected at this stall was approximately £200.

GLOSSARY OF TERMS COMMONLY USED IN AVIATION

Compiled by a Flight Commander.

Aerobatics.—Aerial manœuvres.

Aeroplane.—A heavier-than-air flying machine, supported by the action of air on fixed planes.

Ailerons.—Hinged flaps let into the extremities of the main planes and operated by the control lever, to bank the machine and also to maintain its lateral level. (Origin, French: *aileron*, a fin.—*Ed.*)

Ailerons Balanced.—By connecting the ailerons of each wing, so that when one is pulled down and the other is pulled up the surfaces are made to balance.

Airbrake.—A flap that can be let down so as to increase the resistance of the machine to the air.

Air Pocket.—See **Pocket.**

Air Speed.—The speed of the machine through the air.

Air Speed Indicator—An instrument for registering the speed of the machine through the air.

Altimeter.—An instrument for indicating the height of the machine above the ground from which it started.

Angle of Incidence.—See **Incidence.**

Aspect Ratio.—The proportion of span to chord of a plane.

Back.—A change of wind in an anti-clockwise direction, i.e., from *E.* to *N.*

Backwash.—The disturbed air in the wake of a machine in flight.

Balloon, To.—The upward glide of a machine near the ground caused by the pilot descending too fast and pulling the control lever back too much or too quickly.

Bank, To.—To raise one wing for the purpose of turning.

Bay.—The space enclosed by two struts and their upper and lower adjoining surfaces.

Belt.—The safety strap which secures the pilot to his seat.

Bessoneau.—A tent for storing aeroplanes which can be erected and dismantled in a few days.

Biplane.—An aeroplane with two pairs of wings set one above the other.

Blimp.—Slang term referring to small airships.

Blip, To.—To switch on and off rapidly.

Body.—That part of a machine which accommodates the engine, pilot, passenger and probably the petrol and oil tanks.

Boom.—See **Tail Boom.**

Boss of a Propeller.—The centre portion by which it is attached to the engine. (Readers of this journal may have noticed that a regular contributor on aviation matters has adopted the *nom-de-plume* "Prop Boss."—*Ed.*)

Bounce.—The upward and forward movement of a machine which has struck the ground without flattening out sufficiently.

Brevet.—A certificate showing that a pilot has passed certain elementary flying tests and may be considered a qualified pilot. (French term for license.)

Bumps.—Disturbances or roughness in the air due either to changes of temperature, clouds or wind.

Cabane.—The projecting arrangement of struts above the pilot's head on a monoplane to which the anti-lift wires are attached. (French term for hut or shed.)

Cabre.—Tail down. (French.)

Camber.—The maximum depth of curvature of the upper and lower surfaces of a wing.

Cartwheel.—A particular type of aerial manœuvre.

Cell.—The whole of the lower surface of a plane and the whole of the top surface of the plane above it, with the struts and wires holding them together.

Cellule.—The box-like rectangular compartments in a bi-plane formed by the upper and lower planes and the interplane struts.

Centre of Gravity.—Centre of weight.

Centre of Pressure.—A line running from wing tip to wing tip, through which all the air-forces on the wing may be said to act.

Centre Section.—The centre cellule of a biplane where this cellule is made detachable from the wings.

Chocks.—Wooden blocks placed in front of the wheels of a machine to prevent it from moving when the engine is started.

Chord of a Wing.—The distance between the leading and travelling edge of a wing.

Cockpit.—The pilot's seat.

"Cold Feet."—A complaint, otherwise known as *aerosthenia*, or nervousness of going into the air.

Combustion Chamber.—The space between the top of the piston and the cylinder where the explosion of the mixture takes places.

Compression.—The upward stroke of the piston which compresses the mixture in the combustion chamber.

Conk.—The engine is said to "conk" when it fails.

Contact.—Word used to denote that the switch is on.

Control Lever.—Generally known as the "joy stick." A vertical lever controlling the fore-and-aft and lateral movements of the machine.

Control Wires.—Wires connecting the rudder bar and control lever with their respective controlling surfaces.

Cowl.—A sheet-metal cover generally fitted over or round the engine.

Crash Helmet.—A specially-made flying helmet designed to save the pilot's head in case of a crash.

Crash, To.—To smash the machine.

Dihedral Angle.—A machine is said to possess a dihedral angle when the wings rise upwards from the centre of the machine.

Dive.—To descend steeply.

Dope.—A preparation used to paint the wings in order to render them taut and weatherproof.

Dope Can.—A metal syringe containing petrol for priming the engine.

Drift.—The crabwise motion of a machine over the ground due to a side wind; also used to denote head resistance.

Dual Control.—A system of levers and controls for the engine and machine, so that either the pilot or passenger can operate them.

Elevator.—A hinged controlling surface, or flap, operated by the fore-and-aft movement of the control lever. Always set parallel with the wings of the machine and generally behind them. Used to control the up-and-down motion of the machine and, in steep banks, to make the machine turn.

Empanache.—The tail unit of a machine, consisting of rudder, elevator and fixed tail plane. (Origin, French verb; *empanacher*, to adorn with a plume.—*Ed.*)

Engine Bearer.—The metal framework or tubing to which the engine is fixed.

Exhaust.—The upward stroke of the piston which drives the burnt and exhaust gas out of the combustion chamber.

Explosion.—The power stroke of the engine.

Extensions.—Additional lifting surfaces added to the top planes.

Factor of Safety.—Obtained by dividing the stress at which a body will collapse by the maximum stress it will be called upon to bear.

Fin.—A fixed vertical plane generally fitted in front of the rudder to increase the stability of the machine.

Flares, Ground.—Waste soaked in petrol, or petrol in buckets, set on fire and used as a landing light for night flying.

Flares, Parachute.—Magnesium light electrically fired and attached to a parachute, which is released near the ground to facilitate landing at night.

Flares, Wing Tip.—Magnesium lights electrically fired and used to facilitate landing at night.

Flattening Out.—A phrase used to describe the gradual decreasing of the gliding angle of a machine until it merges into the horizontal a few inches off the ground.

Flight, A.—An organisation consisting of a small group of machines.

Flying Speed.—The speed of a machine through the air necessary to maintain its support.

Forced Landing.—See **Landing.**

Formation Flying.—The practice of a group of machines keeping station in the air.

Fuselage.—The body of a tractor machine.

Gap.—The distance between the upper and lower wings of a biplane.

Gas Bag.—Slang term for airship.

Glide.—To descend with the engine cut off with the machine under control and at approximately the flying level speed.

Gliding Angle.—The angle that the fore-and-aft line of the machine makes with the horizon in order to make a correct gliding descent.

Ground Speed.—The speed of the machine relative to the ground, which may be equal to, greater, or less than the air speed; therefore, ground speed is equal to air speed + or — wind speed.

Hangar.—An aeroplane shed. (Origin, French term for "outhouse."—*Ed.*)

Hate, to Commit.—To be extreme in doing a thing, *i.e.*, excessive "stunting" near the ground.

Heavy-Handed.—Refers to a pilot who is clumsy with his controls and inclined to over-correct.

Height Indicator.—See **Altimeter.**

Hoik, To.—To make the machine climb steeply and suddenly.

Horizon.—The limit of ground in view.

Hun.—Slang term for a person learning to fly.

Angle of Incidence.—The angle that the chord of a wing makes with the direction of motion relative to the air. A particularly muddling term, as it is often measured as the distance in inches that the front spar is above the rear spar when the machine is in the flying-level position.

Inclinometer.—An instrument for showing the angle of the machine relative to the ground.

Induction.—The inlet stroke of the engine.

Joy-Stick.—See **Control Lever.**

Kathedral Angle.—A machine is said to possess a kathedral angle when the wings slope downwards from the centre of the machine.

Keel Surface.—The side surface of a machine as opposed to the head-on surface.

King Post.—A bracing strut generally found on the top of controlling surfaces, such as rudder, ailerons and elevator, in which case it also acts as a lever.

Knock.—A peculiar noise emanating from the engine and indicating some kind of mechanical trouble.

Knot.—A nautical mile per hour; *n.b.*, it is wrong to speak of knots per hour.

Landing.—The action of a machine in coming to earth.

Landing, Forced.—The action of a machine in coming to earth other than at the will of the pilot, *e.g.*, in the case of the engine failing.

Leading Edge.—The point or entering position of a wing.

Leeward.—Away from the wind.

Leeway.—Lateral drift to leeward.

Left and Right.—Always refer to the left and right of the machine and engine as seen by the pilot sitting in his seat.

Lift.—The force exerted by the air on a plane in a direction perpendicular, or nearly so, to the motion.

Log Book.—A book kept by pilots giving details of each flight.

Longerons.—The longitudinal members of the fuselage.

Loop.—A manœuvre in which the machine, after flying straight, does an upward and backward turn or circle, and then continues in the same direction as before.

Lubber Line or Lubbers' Point.—A mark on the body of a compass corresponding with the fore and aft line of the machine.

Machine.—The aeroplane, as apart from the engine.

Motor.—An incorrect term for the power unit or engine.

M.P.H.—Miles per hour.

Nacelle.—The body of a pusher machine. (Origin, French—the car of a balloon.—*Ed.*)

Nose.—The front part of a machine.

Nose Dive.—A very steep descent, with or without engine.

Nose Heavy.—Backward pressure required on the control lever to make the machine fly level.

Nose Piece.—The front central portion of a rotary engine.

Outrigger.—The framework connecting an elevator placed in front of the machine with the main planes.

Pancake.—To drop to earth from a height of a few feet owing to losing flying speed and flattening out too soon.

Pegging Down.—Securing a machine by rope to pegs in the ground so as to prevent it capsizing in a wind.

Pilot.—A person controlling an aeroplane in the air.

Pitch of a Propeller.—The forward distance that the propeller would travel if it were allowed to cut its way, without slip, through some medium such as butter.

Pilot Tube.—Consists of two tubes, one open to the air flow and the other protected. The other ends of the two tubes are connected to the air-speed indicator. One tube is called the pressure tube, and the other the suction, or static, tube.

Plane.—Term used to apply to the supporting surfaces of a flying machine. The planes may be cambered, as in the case of the wings, or flat, as in the case of the trail plane.

Plane, Main.—The wings of the machine.

Pocket, Air.—A disturbance in the air causing the machine to drop.

Propeller.—The airscrew driven by the engine which forces the machine through the air; generally known as the "Prop."

Protractor.—An instrument for measuring angles.

Pusher.—A machine in which the propeller is fitted behind the main planes.

Quirk.—A person learning to fly; slang term for pupil.

Race, To.—Refers to the practice of speeding up the revolutions of an engine to their maximum.

Radial.—Refers to a type of engine in which the cylinders are set radially round the crankshaft, and are stationary.

Radius of Action.—The distance that a machine can fly from its starting point and return without replenishing the tanks. Greatly influenced by the wind factor.

Remu.—A disturbance in the air. (Origin, French verb, *remuer*—to disturb.—*Ed.*)

Remorque.—A motor trailer for carrying aeroplanes. (Origin, French verb, *remorquer*—to tow, or drag.—*Ed.*)

Revs.—Short for revolutions.

Revving.—Short for revolving.

R.F.—Representative fraction. A term indicating the scale of a map.

Rib, Compression.—A rib designed to act as a strut between the front and rear spars of a wing.

Ribs.—The members used in a wing to give strength and shape in a fore and aft direction. Often called "former ribs."

Right and Left.—Always refer to the machine as seen from the pilot's seat.

Roll.—A manœuvre in which the machine does a sideways turn or circle, and then continues in the same direction as before.

Rotary.—Refers to type of engine in which the cylinders are set radially round the crankshaft and revolve.

R.P.M.—Revolutions per minute; generally applied to the engine.

Rudder.—A vertical controlling surface, or surfaces, set parallel with the fore and aft line of the machine, and used to control the direction of flight.

Rudder Balanced.—A vertical controlling surface set parallel with the fore and aft line of the machine, but pivoted some way back from its leading edge.

Rudder Bar.—A pivoted lever, foot-operated, controlling the rudder.

Rudder Post.—The upright member to which the rudder is hinged.

Scout.—A small single-seater machine.

Sensitive.—The reverse to **soggy.**

Sideslip.—A sideways movement of a machine through the air either outwards or inwards.

Shock Absorbers.—Devices for taking the shock of the machine in landing. Sandow elastic, springs or oil are all used for this purpose.

Skid.—An inclined portion of the undercarriage or attachment to the tail which helps to take the shock of landing and drags along the ground in doing so, thus slowing up the machine.

Slipstream of Propeller.—The "wash" set up in the wake of a revolving propeller.

Soggy.—Slow on the control and heavy to handle.

Span.—The measurement of a machine transversely from wing tip to wing tip.

Spar, Main, Front and Rear.—The main members on which the wing is built. The front spar is generally considered the main spar, and sometimes also forms the leading edge of the wing.

Spider.—The front bearing supports and plate of a rotary engine.

Spin, or Spinning Nose Dive.—To go round in a small circle with the nose of the machine pointing directly downwards. A corkscrew descent.

Spiral.—A steeply-banked, continuous-gliding turn (with engine off).

Splice.—To unite the ends of two pieces of wire, rope or wood. In splicing cable wire or rope the strands are interlaced.

Squadron.—An organisation consisting of several flights of machines.

Stability.—The property of a machine whereby it tends to return to its normal flying position if left uncontrolled.

Stagger.—The amount that the leading edge of one wing is set in advance or behind the leading edge of the other plane, measured with the machine in the flying-level position.

Stall.—To lose flying speed.

Strainer.—See **Turnbuckle.** The word can also refer to gauge or chamois leather used to strain petrol through before refilling the tanks.

Streamline.—A shape of a body that offers the least resistance to its path through the air.

Struts.—Vertical members uniting spars in upper and lower planes.

Stunts.—Unusual or exaggerated evolutions in the air. (Origin, American.—*Ed.*)

"S" Turns.—A series of steeply-banked right and left-hand gliding turns (with engine off).

Switch.—A device for allowing or interrupting the passage of electric current generally to the sparking plugs.

Tachometer.—Engine revolution counter.

Tail.—A group of planes set behind the main planes, and consisting of both vertical and horizontal surfaces, used to control the balance of the machine.

Tail Boom.—The long spar connecting the main plane with the tail on a pusher machine.

Tail Heavy.—Forward pressure required on the control lever to make the machine fly level.

Tail Plane.—A fixed plane fitted parallel with the main plane, to which the elevator is attached.

Tail Plane Lifting.—A fixed plane fitted parallel with the main plane to which the elevator is attached. It also carries some of the weight of the machine.

Tail Skid.—See **Skid.**

Taxying.—The progress of a machine on the ground with the engine running, though not fast enough to give flying speed.

Tee.—A ground sign indicating the direction of the wind. Originally an arrow, but it was found to be an improvement to widen the tip of the arrow until it became a T. The wind blows from the cross-piece down the body of the T.

Tender.—A light motor lorry.

Throttle Lever.—Controls the amount of explosive mixture entering the engine.

Ticket, To take.—To pass an elementary flying test, and thus be registered as a certified aviator.

Torque, Engine.—The reaction of a propeller which tends to cause the machine to turn about its longitudinal axis in a direction opposite to that in which the propeller is revolving.

Tractor.—A machine in which the propeller is fitted in front of the main planes.

Trailing Edge.—The rear edge of the wing.

Trestle.—Wooden frames or scaffolds designed to support the tail or wings of a machine when repairs are being carried out.

Triplane.—An aeroplane with three pairs of wings, set one above the other.

Trueing Up.—Adjusting the rigging of a machine so as to correct its balance in the air.

Turnbuckle.—A fitting used to adjust the tension of wires to which it is attached. Also called **Strainer.**

Under-carriage or Under-chassis.—That part of a machine which carries the weight of the aeroplane on the ground, and also takes the shock of landing.

Veer, To.—A change of wind in a clockwise direction, *i.e.*, from N. to E.

Vertical Bank.—A loosely-applied phrase referring to any bank over 45 degrees.

Very's Light.—A coloured light fired as a signal from a special form of pistol.

Volplane.—A glide.

Warp.—The yarn running lengthwise in aeroplane fabric.

Warp, To.—To move the control lever sideways so as to increase or decrease the incidence on a wing with a view to raising or lowering it.

Wash In.—An increasing angle of incidence of a wing towards its wing tip.

Wash Out.—A decreasing angle of incidence of a wing towards its wing tip.

Weft.—The yarn running crosswise in aeroplane fabric.

Windscreen.—A transparent screen mounted in front of the pilot and passenger to shield them from the rush of air by the machine in motion.

Wind Speed.—The speed of the wind.

"Wind Up."—To be frightened of going into the air.

Wing.—The main supporting surface of an aeroplane.

Wing Tip.—The right or left-hand extremity of a wing.

Wing Tip Skids.—Semi-circular pieces of bamboo placed under the wing tips to take the shock off the wings, should the machine heel over on the ground.

Wire, Compensating or Balancing.—The wire connecting opposite ailerons of top or bottom planes.

Wires, Control.—See **Control Wires.**

Wires, Drift.—Used to transmit the head resistance set up by the wings to the main body of the machine.

Wires, Flying Drift.—Internal bracing wires of a wing connected from the front spar to the rear spar diagonally outwards in each cellule.

Wires, Flying or Lift.—Used to transmit the weight of the machine to the wings. They lie upwards and outwards.

Wires, Landing.—Used to take the weight of the wings when the machine is on the ground. They lie downwards and outwards.

Wires, Landing Drift.—Internal bracing wires of a wing connected from the front spar to the rear spar diagonally towards each cellule.

Wire, Snake.—Fine wire twisted round other wires to prevent the latter fouling the propeller, should they break.

Wires, Warp.—Wires used to warp the ends of the wings to control the machine laterally.

Zoom.—To ascend very steeply after flying level at full speed.

PRIVATE WIRELESS MESSAGES AGAIN PERMITTED.

The war-time restrictions governing the transmission and receipt of wireless messages between Australian coast-stations and merchant vessels, and between merchant vessels in waters adjacent to the Commonwealth, are lifted as from December 31, 1918. By the removal of these restrictions any person travelling at sea can now send a wireless message at any time to friends on shore in any part of the world, or to friends travelling in some other ship within range of communication.

Persons living in any part of Australia are now permitted to send messages from their local telegraph office to any friend travelling on board a merchant ship which is within wireless range of Australia.

The cost of sending a wireless message either to or from a ship is quite small; to or from any Australian inter-State, inter-Colonial or trans-Pacific vessels is 6d. per word, so long as the ship is within range of Australian stations; thus a message of ten words (including address and signature) would cost only five shillings.

Messages for passengers on board ship should be addressed as shown by the following example:—

Jones,
Passenger, Makura,
Radio, Sydney.

LABOUR SAVING INVENTIONS FOR TELEGRAPHISTS

In the Adelaide G.P.O. are two inventors of no mean ability. Both are telegraphists, and both are the designers of instruments which lessen the fatigue of operating the modern telegraph key, thereby obviating what is termed "telegraphists' cramp."

The first, Mr. Albert MacDonald, who in his youth attained fame by riding a bicycle across Australia from Port Darwin to Adelaide, is responsible for an instrument known as "The Pendograph," which, on pressing a small lever to the right, produces an unlimited number of firm dots, these in the ordinary way, being made by a pressure to the left. This instrument is used extensively throughout Australasia, and is also popular with many wireless men.

The second inventor, Mr. N. Thomas, has gone one further and produced an instrument that not only makes the dots automatically, but in a similar manner also makes the dashes, the "man behind" merely having to regulate the spacing. In this instrument, which is known as "The Auto-Morse," an extra lever is supplied, thus permitting the use of the machine either as an ordinary key, a dot maker, or a dot-and-dash maker as required.

PROPOSED WIRELESS COMMUNICATION BETWEEN NORTH AND SOUTH ISLANDS OF NEW ZEALAND

At a conference of the Chambers of Commerce in New Zealand recently, the following proposal from the Canterbury Chamber was considered:—

"That in view of the dislocation of business generally, caused to the present telegraphic communication by storms, the Government be asked to place a sum on the Estimates at the next session of Parliament to provide for direct communication between Wellington and Lyttleton, either by a cable or wireless installation."

RECORD OF THE DEVELOPMENT OF WIRELESS TELEGRAPHY AND TELEPHONY AND INTERESTING ITEMS IN RELATION THERETO

The record below is intended to constitute, arranged in chronological order, a résumé of the outstanding events in wireless telegraphy from year to year.

(Concluded from previous issue.)

Rescue Work in Hospital Ships.—The closing months of 1916 and the opening of 1917 witnessed the outbreak of an epidemic of attacks on hospital ships by U-boats. Outstanding instances consist of the ex-White Star liner *Britannic,* the Union-Castle Company's steamer *Braemar Castle,* the R.M.S.P. *Asturias,* and others. Some of them contained a full complement of wounded on board, and the SOS calls for help radiated from their aerials enabled the toll paid by the unhappy and helpless victims of "man's inhumanity to man" to be immensely less than it would otherwise have proved. The International Red Cross Committee, whose headquarters are located at Geneva, in vain addressed a protest to the German Government on the subject.

The Spanish Government intervened, and the enemy undertook to respect vessels which carried Spanish officers as a guarantee against any alleged convoying of troops, ammunition, etc. This agreement was, however, violated towards the close of the year by the torpedoing of further vessels, despite their having carried out the stipulated arrangements.

Fresh Fields for Wireless.—The extension of radiotelegraphy to "women's sphere" became quite a feature of the year 1917 in the U.S.A. A woman's division of the National Amateur Wireless Association was formed in New York for war-time instruction, the first class of twenty-five convening at Hunter College, New York City, on March 12, 1917.

The police of New York have installed wireless apparatus and are utilising its services both ashore and afloat. Commissioner Woods, of New York, pronounced the city's police wireless system a demonstrated success in a public statement issued in June, 1917.

The utility of wireless to lighthouses, lightships, etc., has been extended through the installation by the U.S. Naval Communication Service in October, 1917, of a radiophone fog-warning device near Newport (Rhode Island.)

Ubiquitous Expansion.—Wireless activities have been going on apace all over the world throughout the twelve months under review, although it is not permissible to speak of the action of the British authorities, even in cases so remotely affected by military considerations as South and Central America.

Tests of Marconi's timed spark for continuous wave generation were carried out on January 29 and 30, 1917, between the United Kingdom and the U.S.A.

Valuable data on the use of portable wireless equipment in the tropics was secured by an American scientific expedition, under the direction of Dr. Alexander Hamilton Rice, explorer, which penetrated 2,100 miles up the Amazon River in February, 1917.

Australasia and the Pacific.—Active wireless development has been going on in Australasia and the Pacific. Wireless communication has been opened up with Tulagi (Solomon Islands) and with Ocean Island (Gilbert group). Hitherto merchants and traders have found their activities in these waters severely handicapped by lack of prompt communication.

United States.—The United States having entered the arena of war naturally fell into line with other belligerent Powers in seeking to conceal from their common opponents the specific measures taken to develop their resources. In their case, however, the energy displayed in wireless directions has received the same war-quickening as has been the case with the rest of us. Before joining the battle line, on February 4, 1917, the American Government took possession of the wireless station at Sayville, Long Island, which had previously been controlled by German interests. They (also in pre-war days) announced the opening of a station at San Diego, just north of the Mexican border. This constitutes a third link in a chain of five wireless stations for the U.S. Navy, joining up the American possessions with Washington.

A new station was opened at Cape May (New Jersey) on March 12, 1917, about a mile from the old installation and half a mile from the point of Cape May.

The wireless station of the *New York Herald,* re-equipped by the Marconi Wireless Telegraphy Company of America, was once more in a position to resume operations on February 28, 1917.

The Circuit Court of Appeals, New York City, on May 8, 1917, confirmed the decision of Judge Mayer (reprinted in the WIRELESS YEAR BOOK for 1917) that the De Forest "audion" was an infringement of the Fleming valve; and handed down a unanimous opinion in favour of the Marconi Wireless Telegraph Company of America.

Marconi in America.—The visit of Senatore Marconi to the United States, although he went primarily on a patriotic mission for his country, produced a stimulating effect upon recruiting for wireless in the great republic overseas. The eminent Italian spoke much more freely than is his wont, both with regard to the past and future. He detailed the way in which wireless on aeroplanes multiplies manifold the effect of heavy artillery, and stated that it had practically taken over all the burden of communication in front line trenches. Although of opinion that the wireless telephone is far from attaining its full efficiency, he stated it had already proved of practical utility on some navies. The world-famous University of Columbia invested the distinguished visitor with the honorary degree of Doctor of Science on June 6, 1917.

South America.—Wireless activities have also been rife in South America. A new radio station has been instituted at Viacha, near La Paz, in Bolivia. The Peruvian Government has authorised the construction of a number of installations at various points in the basin of the Amazon, as well as an installation at Cachendo, lying between Mollendo and Arequipa. The Chilian Government voted $175,000 towards the erection in the Magellan territory of three wireless stations.

Brazil and Argentina have both been busy. The latter republic, however, felt itself obliged, in its indignation against the infamy of the *spurlos versenkt* message despatched by Count Luxburg through the intermediary of the Swedish Diplomatic Service, to put a stop to progress with an important Teutonic station in the course of erection, through the intermediary of the German Siemens-Schuckert Company at Plomar in Argentina.

Africa Purged of German Wireless.—The purging of Africa from enemy wireless influence was rounded off by the adhesion to the Allied cause of the Liberian republic. Liberia had a German long-distance wireless station established at Monrovia, the capital of this Black republic, erected as part of the Teutonic world-wide plot for "peaceful penetration."

Scandinavia.—Nor have radio activities been confined to extra European countries. The establishment of wireless has been going on very rapidly in Scandinavia. At the close of the year Norway announced the proximate opening at Stavanger of an extremely powerful installation; Rundemand Station, near Bergen, was opened in the early part of the year, and Trywand Station, near Christiania, is expected to be ready in the near future, whilst Denmark has not only been increasing her radio-telegraphy plant in the Mother Country, and established a school of radiotelegraphy at Svenborg, but has also extended the boon of wireless to her dependencies of Iceland and the Faröe Islands. Sweden also recently erected a long-distance station at Karlsborg.

Netherlands.—Amongst the various other activities of the Dutch Government, we may instance the establishment of two new radiotelegraphic stations on lightships at the Dogger Bank, one situated at the north and one at the south thereof.

British Government.—At the beginning of August the British Government found it advisable, in national interests, to suspend the Transatlantic Commercial Wireless Service both eastbound and westbound.

—*The Wireless Year Book, 1918.*

WIRELESS FOR AMATEURS

Navy Department to Restore Interned Apparatus.

Interviewed in Melbourne on the above subject, the Naval Secretary, Mr. G. L. Macandie, stated that the official view is that conditions are not yet normal. All we have at present, said he, is an Armistice, and until peace is finally declared the provisions of the War Precautions Act cannot be entirely relaxed.

The Naval Secretary made a further statement which we are authorised to publish. Said Mr. Macandie to the writer: "It is understood that there will be no vital departure from the conditions which obtained under the administration of the Postmaster-General; that is, that licenses will be issued to the public who desire to possess wireless apparatus for experimental and other purposes, and that no irksome conditions are likely to be imposed.

"Licensees will be officially notified and their gear handed back to them immediately these can be released."

THE WIRELESS INSTITUTE OF N.S.W. TO MEET IN JANUARY

A meeting of the Wireless Instsitute of New South Wales and of all amateurs interested in wireless telegraphy will be held early in January.

The primary objects of this meeting well be a discussion of preliminary arrangements for obtaining a re-issue of experimental licenses and the release of "interned" apparatus which were dismantled by the Postmaster-General's Department in 1914 under orders issued by the Department of Defence.

The number of licensed experimental stations thus affected exceeds four hundred, while the execution of this order brought to light 208 sets of unlicensed apparatus.

Readers interested in this meeting are invited to communicate with the Honorary Secretary, Mr. Malcolm Perry, Box 2, King Street Post Office, Sydney.