QUESTIONS AND ANSWERS

Under this heading the Editor will be pleased to reply to any questions within the scope of the magazine, provided the following conditions are observed:—

1. Questions to be numbered and written on one side of paper only, and not to exceed four in number.

2. All questions must be accompanied by the full name and address of sender, which is for reference and not for publication. Answers will be published under any initials or nom-de-plume selected by the questioner.

H.A.S. (Brisbane)—*Asks regarding the construction of variable condensers.*

Answer: We suggest you write to Australectric Ltd., 97 Clarence Street, Sydney. They can supply the parts necessary for the construction of variable condensers or ready-made condensers.

H.C.F. (Queensland).—Question (1): *Will you advise me where to apply for a position as a wireless operator on board ship?*

Answer (1): Write to the Traffic Manager, Amalgamated Wireless (Australasia), Ltd., Sydney, New South Wales.

Question (2): *How much would I increase the receiving range of my radio set by the addition of an extra wire in the aerial?*

Answer (2): The addition of an extra wire, as stated, will not materially increase your receiving range. If possible increase the height of your aerial.

H.W.E. (Caulfield, Vic.).—Question: *Is there any likelihood of an open examination of boys between fifteen and sixteen years of age to enter the Military Flying School at Point Cook, Victoria?*

Answer: We have not heard of the authorities contemplating any examination on the lines you indicate. We suggest, however, that you write direct to the officer in charge of the Flying School, who will advise you.

A. Bright (Dungowan).—Question (1): *Is it possible to receive wireless signals with the set connected as shown in diagram?*

Answer (1): Yes, but we suggest that you connect a variable condenser across the secondary coil of the tuner, this will produce better results.

Question (2): *What is meant by* 1,000 *and* 2,000 *metres wavelength?*

Answer (2): Wavelength means the distance between the crest of two consecutive waves, and is dependent on the inductance and capacity of the circuit. This among other kindred subjects is dealt with in simple language in "The Elementary Principles of Wireless Telegraphy," by R. D. Bangay, obtainable from The Wireless Press, 97 Clarence Street, Sydney; price 5s., post free.

Question (3): *Is an amateur permitted to use a transmitting set with a range of twenty or thirty miles?*

Answer (3): Not at present. If you write to the Hon. Secretary of the Wireless Institute of Australia, Box 2, King Street Post Office, Sydney, he will gladly advise of the position regarding this matter.

Question (4): *What is the range of the set shown in diagram?*

Answer (4): It is impossible to say without knowing your aerial dimensions.

C.A.M. (Lithgow).—We regret to state we have been unable to locate a book dealing with the subject you mention. The Company you inquire about has been liquidated and the machine sold.

N.376 (Hamilton, N.S.W.).—The reply to your inquiry has been posted.

W.F. Sievers (East Richmond).—Your letter has only just reached us In reply to your inquiries we recommend the perusal of "The Wireless Experimenters' Manual," by E. E. Bucher. This book is obtainable from The Wireless Press, 422 Chancery Lane, Melbourne. Price 18s.

Reader (Singleton).—Question: *I will be seventeen on November* 12, *and would like to learn general or electrical engineering. What course would you recommend.*

Answer: If you desire to take a correspondence course we suggest that you write to the International Correspondence School, George Street, Sydney, or any other institution or college for particulars that advertises in the daily papers in the Trades and Professions column. If you wish to serve an apprenticeship write to one of the big engineering firms in Sydney, stating your case. Whatever action you take will you kindly mention *Sea, Land and Air.*

Anxious (Jeparit, Vic.).—Our reply to your inquiries has been posted.

G.S.W. (North Castlemain).—For replies see this column next issue.

"SEA, LAND and AIR"

THE AUSTRALIAN NATIONAL MONTHLY

— OF —

TOPICAL INTEREST

OFFICIAL JOURNAL OF
THE WIRELESS INSTITUTES OF AUSTRALIA AND NEW ZEALAND.
THE MERCANTILE MARINE WAR SERVICE ASSOCIATION OF AUSTRALASIA.

Edited by S. E. TATHAM.

CONTENTS

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

All **business communications** should be addressed to
THE MANAGER, THE WIRELESS PRESS, 97 CLARENCE STREET, SYDNEY.

All **Editorial communications** should be addressed to THE EDITOR, *Sea, Land and Air,* 97 CLARENCE STREET, SYDNEY.

Sole European Agents: THE WIRELESS PRESS, LTD., 12 AND 13 HENRIETTA STREET, LONDON, W.C. 2.

Sole Agents for United States of America: WIRELESS PRESS INC., 233 BROADWAY, NEW YORK.
Singapore: KELLY & WALSH.

SEA LAND AND AIR

AUSTRALIA'S NATIONAL MONTHLY

VOL. IV. DECEMBER 1, 1921. No. 45.

TOPICS OF THE MONTH

CHRISTMASTIDE

ONCE more the ever revolving wheel of Time has brought us to the threshold of another Christmas. A few weeks more and the whole civilised world will be celebrating the anniversary of the birth of the Prince of Peace—an event which, despite the lapse of nineteen hundred years, still exercises a potent influence over what is in many respects a sadly materialistic world.

People have been prophesying for countless years that the time was fast approaching when the advent of Christmas would cease to awaken the same thoughts and feelings as were associated with the festival in bygone years. Even now the remark is frequently heard that Christmas is not what it used to be. True, it may not be to many of us because we do not now see it through the rose-coloured spectacles of early youth. But its coming still awakens the better instincts of even the most hardened of men, and by common consent mankind lays aside for a brief period its everyday cares and worries; business men pause awhile in the fierce struggle for modern commercial supremacy, and even nations, when involved in a life or death combat agree to observe a truce over the fleeting hours which mark the hallowed festival of Christmas. It may be, as some people contend, a hollow mockery to model our lives for one day in the year, and be indifferent as to our conduct over the remaining three hundred and sixty-four; but it at least shows that deep down in its heart mankind is still true to the sacred principles of Christianity.

This year the hope is cherished in millions of hearts the world over that as the result of the momentous disarmament conference, which, as these lines are written, is still sitting in Washington, the Christmas message of "Peace on Earth" may ring out over a world that has resolved henceforth to lay aside the weapons of war and pursue the better and more fruitful path of universal peace.

Christmas festivities vary according to custom, tradition and other circumstances,

in different parts of the world. In far-off England the snow will be on the ground, furs and greatcoats will be requisitioned, and family reunions will be held before blazing log fires. Here in sunny Australia vastly different climatic conditions prevail. The mercury soars up about the three-figure line, and cool, shady nooks and iced drinks are most in demand. But here, as there, the spirit of Christmas is the same. Climatic or geographical variations affect it not—a fact which emphasises more eloquently than words the universal significance of this great festival. The rapid strides which have been made in scientific and inventive fields during the past few years have almost taught us to look upon the ultimate solution of the many still unsolved problems of life as inevitable. Unquestionably many triumphs still await the master minds of this and future generations, but who will venture to say that a more universally acceptable belief as to the origin and destiny of man will ever be evolved than the Christianity of to-day, which has stood the test of over nineteen hundred years!

THE IMPORTANCE OF GOOD HEALTH

FEW factors count more in assessing a nation's prosperity than the health of its citizens. Just as an individual's success or failure in life is measured by the energy and application with which his health permits him to attack his daily tasks, so, too, the nation that can boast of a strong, healthy race is invariably rich in the commercial, industrial and social spheres which go to make true national prosperity.

Good health is a matter for individuals as well as for governments, and it is only when there is the closest and most cordial co-operation betwen the two that the best results can be achieved.

Australia is a country eminently suited to the attainment of an ideal in national health. Favoured by a climate which, in many parts, permits people to spend the greater part of their leisure time in the open air, and aided by industrial conditions infinitely less harsh than those obtaining in most parts of the world, it is clear that we have a solid foundation upon which to work. If there is anything in a healthy environment, in which this country is actually and potentially rich, it should not be difficult, provided we proceed along proper lines, for Australia to more than counterbalance her disadvantages of youth and isolation by the high commercial, industrial and moral efficiency of her people.

The recent Health Week campaign in Sydney and the presence of a dread disease in a neighbouring State, should awaken us to the fact that health is necessary for individual preservation even if we are too indifferent to assess its value from a national point of view.

Many of the heritages which this generation will hand down rightly belong to posterity, but there are others which it were better we changed or wiped out altogether while the opportunity is still ours. There can be no question as to what our attitude should be on the subject of health. Medical science has done much to conquer the ills which afflict mankind, but a great deal remains to be done. As individuals, however, we can safely leave the big problems of disease to the medical profession, knowing that there is a vast field of endeavour for the layman in dealing with the apparently lesser matters of personal health and home sanitation, which are, however, actually the "things that count."

GOOD ROADS MOVEMENT

THE recent meeting of the Federal Council of the National Roads Association in Melbourne once more directs attention to the vitally important fact of the value of good roads. Unfortunately Australia is backward in the matter of grappling with her road problem in comparison to most other countries, a position for which it is difficult to assign a reason. With her vast distances it is surprising that the great benefit which would follow the building of good roads throughout the length and breadth of Australia did not long ago stir the authorities into action. It will be very many years before this country is served by a railway system ample to her needs, and even when such time comes it is essential that the efforts of private individuals to augment or improve the then existing services should at least have the assistance of good roads.

A tremendous volume of business in the shape of motor transport and passenger services is at present being carried on throughout Australia, and it is impossible to estimate the pounds, shillings and pence value of these enterprises, apart altogether from the convenience which they provide for tens of thousands of people weekly. That they are being carried on at a profit is evidenced by their continuance, but at the same time it is beyond question that an unnecessarily heavy burden is being imposed upon the enterprising promoters by the unsatisfactory condition of our roads.

In the old days when transport was carried on chiefly by horse and bullock teams, and time was not of the same importance as now, there may have been an excuse for allowing the policy of drift in regard to our roads to continue. With the advent of motor transport, however, a fresh responsibility is cast upon those charged with the upkeep of the country's thoroughfares, and although action is long overdue, it is gratifying to observe that a determined move is at last being made. Unquestionably a huge sum will be necessary to place our roads in proper condition, but it is constructive work of the best kind, and few people will question the wisdom of such expenditure. Good roads will prove a powerful lever in pushing forward land settlement. They will cheapen carriage, and therefore reduce the cost of living; and last but not least, they will make Australia known to our own people and the tourist from other lands to a degree which is eminently desirable, but has hitherto been unattainable.

It is not enough to desire what we want, we must believe it is coming, we must expect it, we must have faith that it will be ours, faith that it will come to us. Faith is the magnet which draws it; the positive creative power which produces it.

Every man takes care that his neighbour shall not cheat him. But a day comes when he begins to care that he does not cheat his neighbour; then all goes well. He has changed his market cart into a chariot of the sun.

AUSTRALIA'S OIL FIELDS

OBSERVATIONS FROM A GEOLOGICAL SURVEY

By SIR EDGEWORTH DAVID, K.B.E.,
Professor of Geology, Sydney University.

Professor Sir Edgeworth David, of the Sydney University, recently returned from an extensive geological tour of South and Western Australia, and in the following article, gives an outline of the various points of interest which came under his observation during the tour.—Ed.

THE discovery of traces of true mineral oils in the Kimberley district of Western Austrália is, so far as is known, the first recorded discovery of that nature in Australia. It is necessary that caution should be observed in assessing its value, but it can be said that from a geological point of view, the prospects are distinctly encouraging.

Mr. T. Blatchford, Assistant Government Geologist in Western Australia, recently toured the Kimberley district, and, as the result of a careful examination of various localities where traces of oil or asphalt have been recorded, a bright, brittle mineral known as "asphalt glance" was discovered at the junction of the Ord and Negri Rivers, in the extreme north-east of Western Australia, close to the boundary of the Northern Territory.

Owing to the fact that very little prospecting has yet been carried out in this region, it is impossible to say how far these traces of oil extend, but it is highly probable that they extend into the Northern Territory.

The preliminary investigations have been carried out over an area at Price's Creek, to the east of where Christmas Creek junctions with the Fitzroy River. This is approximately two hundred miles south-west of the spot where "asphalt glance" was discovered on the Ord River, and about one hundred and sixty miles in a direct south-east line from Derby. There are various indications of oil in the areas referred to. At Price's Creek they are in the form of small seepages, which yield a distinct smell of petroleum, while at a spot in the Rough Range the grass will not grow on account of the oil seepages. Tests, which have been made of samples taken from the ninety-foot bore near Price's Creek revealed the presence of true mineral oil. The quantities were certainly small, but the proportion increased slightly with the depth.

The actual weight of the oil in comparison to that of the rock formation, thin limestones and shales, in which it is found, is only one part in four thousand, but even this relatively small amount should be sufficient to supply quantities, which, under favourable conditions for concentration and observation may yet be found to be sufficieitly extensive to be of economic value. As a result of Mr. Blatchford's investigations of the structure of the Kimberley oil-bearing region, it is certain that broad, gentle arches exist over a very wide area. The gentle curve of the arches is specially favourable for the concentration and preservation of the oil, in view of the great geological antiquity (some three hundred millions of years) of the oilfield. If in a very ancient oilfield, like that of Kimberley, the anticlinal arches were steep instead of gentle, there is a serious risk that the rock at the crowns of the arches may have become cracked and in the millions of years that have elapsed since their formation, all the oil may have escaped up these cracks and been evaporated. In gentle arches with inclinations of not more than about five degrees, the risk of the oil having escaped is much less.

Expressed in terms of actual years the Kimberley deposits, as just stated, may date back three hundred million years, but even this great antiquity of the area, does not preclude the possibility of oil being found in probable payable quantities. It is needless to emphasise of what far-reaching importance to Australia the discovery of a large payable oilfield in such a region would be. There are several fine harbours on this north-western coast which would form good naval bases, and at the island of Yampi, just north-east of the entrance to King's Sound, there is a vast deposit of iron ore, readily accessible for exploitation.

It is unquestionable that the opening up of such a field would attract a big population to a portion of Australia, which, at the present time, is sorely in need of more people. Naturally, everything hinges upon the as yet unanswered question, are there any definite oil pools under the anticlinal arches of sufficient size, to be of commercial value? From the mining point of view there are, of course, obvious risks attending investment, but in view of the all-round favourable indications up to the present, such risks seem to be quite reasonable. The only means by which the all-important question of the oil wealth of this region can be definitely answered is by systematic boring under scientific direction.

The next step to the possible development of Kimberley should be an immediate careful geological survey to locate the most favourable anticlinal arches for prospecting operations. Experience demonstrates that many oilfields have been undeservedly classed as failures owing to hasty prospecting in the wrong places.

Irwin Coal Field.

A visit to Gin Gin, about sixty miles north of Perth, gave an opportunity of inspecting some interesting phosphate deposits which had been prospected there. These occurred in chalk formation. They dip southerly and have been struck in some deep artesian bores under Perth, where the formation took the form of sands of a brightish green tint filled with marine fossil organisms. About two hundred miles north of Perth, an inspection was made of the Irwin River coalfields. An interesting problem for future geological determination would be the question of the probable depth at which Irwin coal measures may pass under Perth.

Authorities are at present inclined to believe that these measures, if they exist there at all, are too deep for mining under existing conditions, owing to the difficulty of ventilation. It is possible, however, if the seams, which in their outcrop are too high in ash to be workable, improve as they gradually come west and south from the Irwin they will be found workable at certain points, intermediate between Perth and Irwin River.

Gold and Diamonds.

The Nullagine and Marble Bar goldfields in the Pilbara area, a further distance of about seven hundred miles from the Irwin River provided a field for close scientific investigation. It is at the former that the world-famous conglomerates, which produce gold and diamonds, are to be found. It is possible that these conglomerates, although not distinctly of glacial origin, may represent redistributions of glacial materials swept down by thaw water rivers escaping from ancient ice-sheets. These have left impressive and enduring evidence of their past existence in the neighbourhood of Peterborough and other places in South Australia. The diamonds contained in the conglomerates are probably amongst the oldest in the world. They appear to be of alluvial origin, and to have been derived from older rocks. Up to the present, only small stones have been found, weighing generally about half a carat. The largest one yet discovered realised over £6.

Water Supplies in the West.

An outstanding feature of many of the large areas of sparsely populated districts in Western Australia, as for example the region between Meekatharra and Marble Bar, is the ease with which good supplies of fresh water, suitable for human consumption, can be obtained from wells ranging from only ten to forty feet in depth. Travelling stock is supplied with water drawn from these wells by means of large canvas buckets holding about thirty gallons each. Some of the wells yield as much as thirty thousand gallons of water a day, and in some instances the shaft is deep enough to provide for the storage of ten thousand gallons. Each well supplies sufficient water for about one thousand head of cattle a day.

At the various homesteads the household and garden supply is raised by means of

windmills. The fact that the water is deficient in common salt and rich in nitrates makes it especially useful for irrigation purposes.

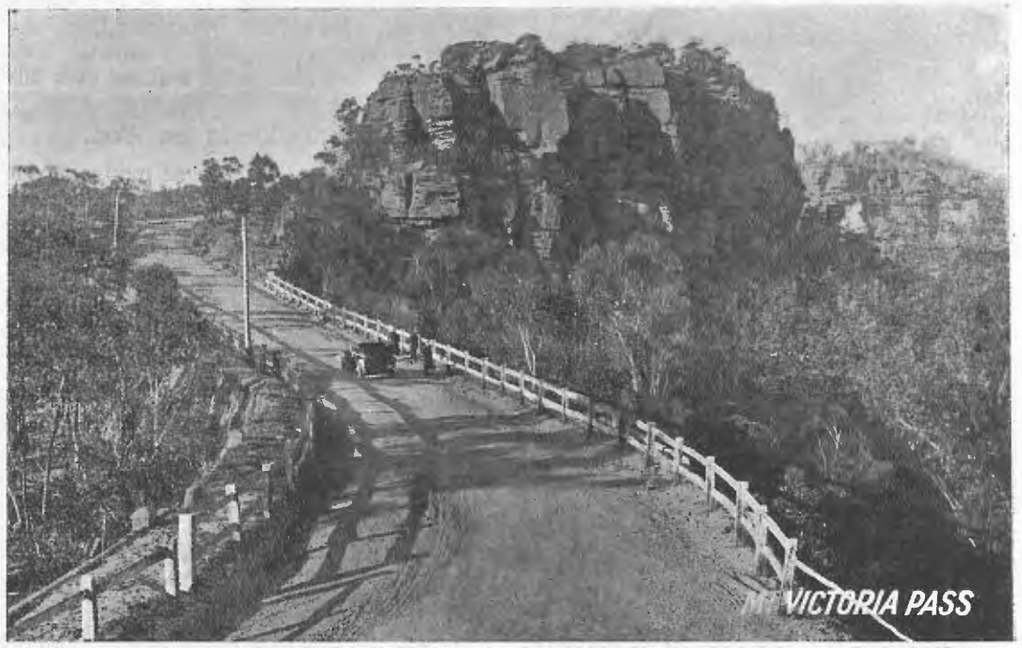
Nullabor Plains.

The Nullabor Plains in South Australia are probably the largest plains of their type in the world, being about four hundred miles east to west and over three hundred miles across from north to south. They were formed of the material of an ancient sea, known to geologists as the *Miocene* Sea, which had been uplifted from a height of two hundred feet along the coast to some five hundred feet above sea level to the north of the trans-continental railway line. For the most part the plains are entirely devoid of trees except for a fringe of mallee or ti-tree a few miles wide along the coast. The water on the eastern half of the plain is slightly salty, but still is useful for watering stock.

Recent tests have demonstrated that it will be possible to greatly increase the number of artesian and sub-artesian bores in these regions without any risk of exhausting the water supply. This means that stock holdings can be multiplied, which in turn ensures that a much greater population than at present can, and no doubt will, be carried.

The commercial salt output of South Australia is derived chiefly from the gypsum and salt lakes of Yorke Peninsula, and is estimated to be worth about £180,000 per annum. Vast deposits of gypsum, estimated by Mr. R. L. Jack (Deputy Government Geologist to South Australia) to amount to seventy million tons, were recently discovered between Eyre's Peninsula and Streaky Bay. It is believed that these deposits will provide South Australia with gypsum for the manufacture of plaster of Paris and for fertiliser for many years to come.

MT. VICTORIA PASS, BLUE MOUNTAINS



Showing the old road down the mountain spurs to the Jenolan Caves.

THE LEAGUE OF NATIONS

By H. H. JOHNSON

LONG ago men perceived that within the State true liberty could be attained only by the surrender of license. Society manifestly implied restraint; self-restraint by the individual and, when that failed, then group restraint of the individual.

Now and again for generations, leading minds have pointed out the need of applyiny this principle to the society of States as a condition precedent to the suppression of wilful and ungovernable action on the part of States. That which blocked the way was the general acceptance of Vattel's theory of sovereignty, conceived as making the will of the State supreme.

The right to declare war without securing the consent of the Society of States, and without in fact assigning sufficient reason for the act was recognised as a legal right. The fact that the interests of States other than the State directly attacked would be affected, that some of them might inevitably be drawn into the conflict with loss of blood and treasure, and therefore ought to be consulted before it was precipitated, was ignored.

Plato's definition of the free man will be recalled. He said: "The free man is he who has sufficient control over his appetite to be governed by reason in choosing between good and evil." In that sense the States were manifestly not free. In the absence of restraining forces from outside the evil intentioned among them were slaves of their own greed. The good intentioned were the slaves of circumstances; they were the victims partly of the will of others and partly of blind forces.

Wars will not cease until justice prevails, and the true freedom of States will not be realised until we substitute conscious and directed action for the uncontrolled forces guiding our destinies to-day. We are called upon now to organise for justice between States and, when necessary, to strike for justice. And how much less frequent the need of striking at all when such absolute and potential power as a world league will represent, shall be at the back of right.

In the past the many attempts to improve international relations have taken the form of purely voluntary institutions. Sovereignty must needs remain inviolate. States might be invited to use certain institutions designed to facilitate peaceful settlement of disputes, but they were not to be forced to do so, because compulsion would impair sovereignty. The Hague institutions are far from valueless. They have been useful and will doubtless be retained and developed. The criticism levelled at them is that they do not positively discourage war.

The best known of all former alliances between nations was the Holy Alliance formed in 1815. Its sixth article agreed to hold periodical conciliar meetings "for the repose and prosperity of the nations, and for the maintenance of the peace of Europe," but there was to be no abrogation of sovereignty. The Holy Alliance was characterised by Metternich, the Austrian statesman, as "a combination for the preservation of everything lawfully existing." The parties to the alliance were Russia, Austria and Prussia. The alliance did not in terms commit the powers to a policy of reaction against Nationalism and Liberalism, but Metternich directed it into that channel, and the alliance became in action a Monarchial League against Liberalism. Great Britain, although not formally agreeing to it at its inception, joined later; but abandoned it on the resolution of the three original powers to coerce Liberalism in Spain. The alliance lasted until 1833. Canning rejoiced at its end. "Things," he said, "are getting back to a wholesome state again. Every nation for itself."

What a contrast between the spirit of those times and the idea of the League of

Nations as expounded by ex-President Wilson, who said in discussing Article 10:

"It is a specific pledge of the League members that they will unite to resist exactly the things which Germany attempted, no matter who attempts them in future. We have now to choose whether we will make good or quit. The issue is between the spirit and purpose of the United States and the spirit and purpose of Imperialism no matter where it shows itself. No one who opposes the ratification of the Versailles Treaty and the adoption of the League's Covenant has proposed other adequate means for bringing about settled peace. There is no other method of doing so."

The Bryan treaties, negotiated in pairs between the United States and more than thirty countries, was the first great step towards a League of Nations. The pacts denied to the signatories the right to make war until resort had been had to inquiry. Unlike most general treaties which usually omit questions of honour, vital interest, or territorial integrity, the Bryan treaties covered disputes of every kind. If a dispute was not stilled by the report of the inquiry the parties were free to go to war. Whereas the Hague simply invites inquiry, the Bryan treaties required it before nations may fight. We have in the Bryan treaties for the first time in history an institution which actually forbade immediate resort to war and modified the sovereignty of States to that extent.

The effective method to prevent war would be to create a world legislature to develop law, a law court to interpret it, and a world executive to administer it. Unfortunately such an organisation, which would amount to a super-State, is impossible under present conditions of world prejudice and opinion. The problem of how far we can go in this direction at the present time has been one upon which groups of men in various countries have laboured during the period of the Great War. That is the problem the Paris Conference had, before it, not forgetting such incidental questions as those of armaments, international labour interests, the "open door" in spheres of influence, and joint action in backward countries, all of which could only be dealt with by the Central Committee without special constitutional provision therefor.

To realise to what extent the Paris Conference met these demands, a careful perusal of the twenty-six clauses of the Covenant of the League of Nations is essential.

It has been said that the weakness of the League lies in the unanimity rule laid down for the Assembly and Council and that the strength of the Covenant rests in the fact that presently, if not immediately, all the progressive powers of the world are to operate under it.

Just as we were borne up during the Great War by the conviction that while wrong often triumphs locally, wrong universally recognised as such could not triumph, so we may face the future with this consideration to which all others are subordinate.

Recently the writer perused an exposition and a review of the Treaty of Peace with Germany (embodying the Covenant of the League of Nations) which took place in the United States Senate. In view of that country's refusal to ratify the Treaty of Peace which was accepted by such a large number of other nations, the reading of the arguments both for and against was very instructive.

There were many objections, not only to the wording and possible meaning of the Treaty, but underlying it all there was apparently a majority voice which was opposed to any abrogation of the sovereign rights of the United States. This feature appears in the Senate's objection to any other nation having more votes in the Council of the League than the United States. It was pointed out that Great Britain, under the name of the British Empire, has one vote in the Council of the League, but she had four additional votes in the Assembly of the League for herself, governing dominions and colonies, which, however, America agreed were most properly members of the League and signatories to the Treaty. She also controlled the vote of India, which is neither a self-governing dominion nor a colony, but merely a part of the Empire. The Senate of the United States failed to see why America should have but one vote in the Assembly of the League when the British Empire has six. On the face of it the United States seems to have good cause for complaint in what might be called the equity of representation, but when the United States influence in her favour is so powerful in such countries as Cuba, Equador, Haiti, and other South American nations which, like the British Dominions,

each have a vote at the Assembly meetings, the position is not quite so acute as the Senate represented.

In addition to this and many other objections, there was a refusal to accept any obligation under Article 10 about which so much has already been written. The final voting on this point was twenty-six in favour of accepting Article 10, and fifty-six against accepting the implied obligations. Ex-President Wilson, who was sponsor for the Covenant of the League, explained his point of view in the following remarks:

"Article 10 is in no respect of doubtful meaning when read in the light of the Covenant as a whole. The Council of the League can only 'advise upon' the means by which the obligations of that great article are to be given effect to. Unless the United States is a party to the policy or action in question, her own affirmative vote in the Council is necessary before any advice can be given, for a unanimous vote of the Council is required. If she is a party, the trouble is hers anyhow. And the unanimous vote of the Council is only advice in any case. Each Government is free to reject it if it pleases. Nothing could have been made more clear to the Conference than the right of our Congress under our Constitution to exercise its independent judgment in all matters of peace and war. No attempt was made to question or limit that right. The United States will, indeed, undertake under Article 10 to 'respect and preserve as against external aggression the territorial integrity and existing political independence of all members of the League,' and that engagement constitutes a very grave and solemn moral obligation. But it is a moral, not a legal, obligation, and leaves our Congress absolutely free to put its own interpretation upon it in all cases that call for action. It is binding in conscience only, not in law."

Article 10 seems to constitute the very backbone of the whole Covenant. Without it the League would be hardly more than an influential debating society.

As will be seen by the proportionate voting on the acceptance or rejection of Article 10, the minority in that case was by no means a small one, and on the question of unqualified ratification of the Treaty the voting was thirty-eight for and fifty-three against, a smaller difference than the result of the voting on Article 10. The reason for quoting the number of minority votes, which in all cases were numerically important, is to lead up to the views of the minority who drew up a report in the following terms:

"The League of Nations proposes to organise the nations of the world for peace, whereas they have always heretofore been organised for war. It proposes to establish the rule of international justice in place of force. It proposes to make a war of conquest impossible by uniting all nations against the offender.

"It is the first international arrangement ever made by which small and weak nations are given the organised strength of the world for protection.

"It is a covenant between many nations by which each agrees not to do certain things which in the past have produced wars, and to do many things which have been found to preserve peace.

"It is a working plan for the gradual reduction of armaments by all members simultaneously, in proper proportion and by agreement.

"It sets up arbitration as a friendly method of adjusting disputes and inquiry when arbitration is not agreed to. In both cases it provides a cooling-off period of nine months during which the differences may be adjusted.

"It preserves the territorial integrity and political independence of each member and leaves to each the exercise of its sovereign rights as a nation.

"It will save the world from wars and preparations for wars.

"It will reduce armies and navies and taxes.

"It will help to remove the discontent with Governments in all countries by making government beneficent and devoting its revenues to constructive rather than to destructive purposes.

"It is the only plan proposed to redeem the world from war, pestilence and famine. The only one by which a stricken world can be redeemed from the disasters of the late war and the dangers of impending international chaos."

The majority of the people in the United States undoubtedly desire a League in one form or another. The Disarmament Conference at Washington at the desire of the United States of America is quite sufficient evidence of this.

The old standards of exclusiveness were among the blindest, cruellest and most embittering things that our civilisation possessed. If the idea of the League is fundamentally a good one, we ought to welcome every widening of the portals of intercourse which extends its sense of community.

During the seven years since the outbreak of war—seven years has always been accounted a marked span in individual life—the world's condition, physical and mental, has been altered utterly. Into seven years since August, 1914, have been crowded achievements, catastrophies, revelations and vicissitudes in a tremendous sweep. Hictorically all those of us who survive have lived in that sense far more than our share.

We waged war to establish a saner order of international justice. The main object of the League of Nations is to reconcile the belligerents. During the war the nations worked as they had never worked

before and organised as they had never been organised, and along the same lines nothing necessary to the success of a League which would be acceptable to all progressive nations is impossible.

The Covenant of the League in the form adopted in Paris is a distinct contribution in depth, weight and direction to the course of current and future civilised thought. It appears to be a shrewd elucidation of civilisation's need to-day. It has certainly deepened the world's consciousness. Sentimental cynicism will in time be forgotten and the League of Nations idea will some day be appreciated at its true worth.

The world which has been sorely stricken by the Great War would be a much poorer place if punished like the curiosity of *Psyche* by the flight of the thing it really desires. The Covenant reveals a maximum of expression and minimum of apparatus to handle an overwhelming idea in which an unprecedented number of human beings are interested.

Human personality has always been the *terra incognita*. Man desires to assert his freedom. It is the psychologist who will do the talking in future, and the first thing he will do will be to abolish ten thousand categories. It is a particularly hard world for those who were born before Einstein and do not know that the only unchanging factor of existence is change.

It may be safely assumed that the League of Nations has justified its existence. Is the peace of the world better secured than when the League of Nations was founded? Are the methods appropriate to the conditions with which it is called upon to deal? We may well be satisfied with what the League of Nations has accomplished to-date. The chief danger lies apparently in attempting too much. If it avoids this it is probable the time will come when the whole world will wonder how we ever got on without a League of this kind.

To make the League of Nations an effective instrument in the world, either in its present form or in a form which would be more acceptable to all nations, a campaign of education is necessary.

It seems as though the Anglo-Saxon race is destined to lead the way as it has led the way in past political and religious reformations. Failing any effort at education and the consequent absence of response on the part of mankind to the ideal of a League of Nations, what are we to look for?

Are we to duplicate indefinitely on the political side a condition from which we have been liberated on the religious side? Are we to struggle along spilling oceans of blood and wasting mountains of treasure which will eventually result in the financial and economic exhaustion of civilisation? Or are we to endeavour to so conduct international affairs in the future that sooner or later will be brought about a better understanding between peoples, and that resultant peace of mind that alone is worthy of sustained endeavour?

WIRELESS TELEPHONE CONCERTS

For six months past the Amalgamated Wireless Company has provided regular Monday night concerts from its Melbourne headquarters to a select audience distributed all over the States of Victoria, South Australia and Tasmania.

The Company has installed one of the latest types of wireless telephone transmitters in its building known as Wireless House, in Little Collins Street, and from eight to half past eight o'clock every Monday night ether wave concerts are given for the benefit of all those within range who have suitable receiving apparatus.

This unique entertainment is regularly received at no less than three hundred houses which are equipped with suitable wireless receiving instruments. It is also known that they are regularly received as far distant as Hobart in Tasmania, Adelaide in South Australia, and by ships at sea up to a distance of over eight hundred miles.

The first successful demonstration of wireless telephony between the mainland and Tasmania was made in October, 1920, when the apparatus now used by the Company was first installed at Brighton, near Melbourne. As soon as the plant was erected both vocal and instrumental selections were received clearly in Hobart.

RAILWAYS OF THE FUTURE

AN OUTLINE OF THE SCHEME FOR THE CITY AND SUBURBS OF SYDNEY

SOME INTERESTING DETAILS

By J. J. C. BRADFIELD, M.E., M.Inst.C.E.,
Chief Engineer, Metropolitan Railway Construction Branch, New South Wales

Central Railway Station, Sydney (New South Wales).

IN Sydney, as in many other cities which were well established when the great railway construction boom of "the fifties" took place, the railway station was arranged as a terminal on the edge of the business section of the metropolis, partly on account of lack of vision as to the future importance of the city, but chiefly because of the cost of establishing the main station where land values were high. Then, as now, money was the controlling factor, and it was easier and cheaper to establish the terminal in the Cleveland paddocks, just outside the city, rather than in the city itself.

Central Station, constructed in 1906, has as its southern boundary, Devonshire Street, which street was the northern boundary of the original terminal station completed in 1855. The station is at the south end of the business area, a peninsula about two and a quarter miles long by half a mile wide. A special tramway system was laid down to convey the railway passengers between Central Station and the city, which system is now quite inadequate to cope with the morning and evening rush-hour traffic. Passengers approximating two hundred thousand per day travel between the station and the city, by street cars or foot. During the peak of the evening homeward traffic, i.e., from ten minutes past five o'clock to ten minutes past six o'clock, some forty thousand people arrive at Central Station, and are taken thence to their destination by trains, which to the number of sixty, mostly of ten cars each, depart during that time. Trams run past three sides of the station and into the station building and traverse the four principal streets running north and south—Elizabeth, Castlereagh, Pitt

and George Streets. The tramway traffic has reached a point of such density that the city system is unable to cope with more traffic, and increased tramway accommodation on the streets is just about impossible.

On the northern side of the harbour, where the terminal station is at Milson's Point, similar conditions obtain. Tram and train disembark their teeming thousands at "The Point," to continue their journey across the water on commodious ferry steamers, plying at six minutes intervals during the busy hours of the day. These passengers on landing at the Quay either walk or take street cars to their destination. Similarly from the hinterland of Manly, from Athol, Mosman, Cremorne, Neutral Bay, McMahon's Point, Balmain and Watson's Bay, trams carry many thousands of passengers to the water's edge to be conveyed to and from their daily avocations or pleasure, by privately-owned ferry steamers. These ferries ply to many wharves along the harbour foreshores not served by tram or train.

One hundred and thirty-three years ago Governor Phillip landed near the head of the Cove and founded Sydney, the population then being one thousand and thirty-five all told. Between Botany Bay and Broken Bay nearly one million people now reside. The little clearing in the bush of those days, is now exceeded in commerce and importance by only four ports in the United Kingdom, *viz.*, London, Liverpool, The Tyne and Cardiff. The average traffic on the metropolitan railway system is three hundred and twenty-five thousand passengers daily; on the tramway system nine hundred and ten thousand daily; whilst during the year some forty-one million passengers are ferried across the harbour.

The land area of Greater Sydney within a two-mile radius of Central Station is seven thousand and forty acres, and that enclosed between circles of two and four miles radius is nineteen thousand two hundred and ninety-four acres. Approximately thirty-five per cent. of the population reside within the two-mile radius, twenty-six per cent. between the two- and four-mile radius, whilst thirty-nine per cent. occupy the remaining metropolitan area.

A city increasing steadily in population is a prosperous city, and, given facilities to travel, the number of journeys per unit of population increases much more rapidly than the population increases, and it has become more and more difficult to make the channels of passenger transport equal to the ever-growing demands. The traffic conditions necessitate provision being made to bring the people to the business area by a transit system of greater capacity and speed than the existing tramway system, although this is not excelled in any part of the world. In other countries where similar conditions have arisen, the solution, in recent years, has always been by means of rapid transit electric railways.

As the railways and tramways are all owned by the State, it has been found possible to devise a scheme which will enable trains to be run between the suburbs and outlying districts, and the business area of the city, without compelling passengers to change from one railway system to another as is usually necessary in large cities where the transit systems are controlled by separate authorities; or of changing from train or ferry to the tramway system as is at present necessary in Sydney.

In the general location of the new metropolitan railways there were four chief aims:

(1) To segregate the suburban from the long-distance country traffic at the Central Station and run all suburban trains into and around the city on the city loop without having any terminal station which would render the reversal of a train necessary in places where the traffic is congested.

(2) To divert to the railways, before they reach the confines of the city, a large number of the passengers who now travel to and through the city by trams.

(3) To so locate the railways that when outlying suburbs are sufficiently developed by existing tramways and ferries, the passengers now so provided for can be brought to the city by a fast electric railway service, remodelling the tramways where possible so as to become a part of the electric railway system.

(4) To so locate the railways to prevent, where possible any extension of the tramway system, so that the future passenger traffic of the metropolis can be handled as far as is possible by a fast electric railway service, to which the trams will be feeders.

The bird's-eye-view of Sydney and suburbs shows clearly the electric railways decided on. The existing steam railways are shown by black lines; those within the suburban area must be electrified to enable trains to operate on the city railway. In the first instance, the railways, Sydney to Bankstown, Sydney to Sutherland, Sydney to Parramatta and Hornsby, and the Milson's Point to Hornsby railway, will be converted from steam to electric traction; later, as required, the electrified zone will be extended to the Hawkesbury River, to Penrith, Campbelltown and Waterfall so as to include the whole of the railways in the suburban area. Railways constructed to handle goods traffic only, are shown by dotted black lines. In full white lines are shown the electric railways already approved by Parliament, *viz.*, the City Railway, the Eastern Suburbs Railway, the Western Suburbs Railway and the Harbour Bridge Railway, and in dotted white lines future extensions, *viz.*, North Sydney to Mosman and Athol; North Sydney to Manly, *viâ* Northbridge, and to Narrabeen and Barrenjoey; St. Leonards to Eastwood; Bondi Junction to Watson's Bay; Randwick to La Perouse; Sutherland to Cronulla; Bankstown to East Hills, and Tempe to Salt Pan Creek.

The harbour which dominates the layout of the railways, and extends inland for about thirteen miles with a foreshore line of one hundred and eighty-eight miles, does not average a mile in width through its length. The complete transit scheme which necessitates a bridge across the Harbour from Dawes Point to Milson's Point, and a subway under the Harbour from Miller's Point to Balmain, will form four inter-connected loops, *viz.*, the city loop and three suburban loops to serve the eastern, western and northern suburbs,

Plan showing the present and proposed electric railway service for the city and metropolitan area of Sydney. Reference to the scroll in the bottom right hand corner will explain the significance of the various black and white lines.

with spur lines connected thereto to serve the outlying suburban districts.

The distinctive features of the City Transit Scheme are:

(1) It is an integral portion of the railway system of the State, and when the gauge is unified, of the railway system of Australia. The whole of the suburban railway service, will ultimately be taken around the city, without passengers having to change trains; the interstate and country express trains can traverse the system without any restrictions.

(2) Where two tracks carry traffic in opposite directions and must cross each other, the crossings will be by means of flyovers—*i.e.*, one train will pass above the other—thus avoiding all risk of collision and greatly increasing the train capacity of each track.

(3) The loop system, the advantages of which are manifold, the most important being the reduction in working expenses, as the train wheels can be kept profitably running during the full operating periods without any waste of time for unprofitable shunting. The gain to the travelling public will be equally satisfactory, for many of the stations on these double track loops will have practically a double service. Passengers can reach the city, equally conveniently by either of the two wings of the loop.

From the bird's-eye-view it will be seen at a glance how the railways will give all suburbs direct and rapid communication with the city. Manly, nine miles distant, with a non-stop train, will be within eighteen minutes of the General Post Office; Narrabeen, *viâ* Northbridge, fourteen miles distant, within half an hour. Eastwood and all stations beyond will be two miles nearer the General Post Office, *viâ* St. Leonards and the North Shore Bridge, than *viâ* Central Station. All stations north of Hornsby will be seven miles nearer by rail than at present. Passengers now arriving at Central Station from the existing railways, will reach the Quay in six minutes, about the time it now takes to walk from the train and board a tram at Central Station, during the morning rush hours.

Passengers from the eastern, western, and all tramway suburbs, will have their time of journey shortened by more than half, and will travel much more comfortably and cheaply. A passenger from Bondi Junction would reach the city by electric train in twelve minutes; by tram the time of journey is twenty-nine minutes. From Newtown Bridge the time of journey to the Quay would be thirteen minutes by electric train, as against thirty minutes by tram. From Weston Road, Balmain, to Wynyard Square will take ten minutes by electric train; by tram and ferry, the present method, the time is at least twenty-five minutes.

In designing the system, a decision had to be made, whether the railways in the city and immediate suburbs were to be wholly underground, deep down, and served by lifts and escalators, or whether they should be located just below the surface, reaching the open-air in places, *i.e.*, partly sub-surface and partly elevated.

The harbour crossing was largely the deciding factor—was it to be bridge or tunnel to North Sydney? If bridge, the location of the metrolopitan railways would be for the most part open-air, if tunnel mainly underground. An impartial study of the question made it quite apparent that the northern suburbs could only be efficiently developed by the construction of a bridge. Subways would not only be more costly to construct in the first instance, but would be more costly to maintain and operate than a bridge, whilst in addition, there would be the continual cost of artificial light, drainage—every subway yet constructed leaks—and ventilation, all highly detrimental factors.

Underground railways in the city and immediate suburbs served by escalators and lifts would have been more costly to construct, maintain and operate, than a system partly sub-surface and partly in the open air, and much less convenient for the passengers; whilst there would have been a greater annual cost for lighting and ventilation.

Economy and efficiency were greatly in favour of a location in the city proper of a system partly sub-surface and partly in the open air. In the suburbs, where land values are not nearly as high as in the city, an open-air location was the cheapest and best. The system as designed will be underground from Liverpool Street along the western side of the city to Harrington Street, and from Macquarie Street along the eastern side of the city back to Liverpool Street. The eastern suburbs railway will be underground from St. James's Station in Hyde Park to Darlinghurst, and the western suburbs railway from Darling Street, Balmain, to Wynyard Square. Except for other short tunnels which are unavoidable on account of the topography of the country, the whole of the railways will be in the open air, and passengers will enjoy the maximum of fresh air and sunlight.

There are objections to the location of electric railways underground from the point of view of health, *viz.*, the deleterious effect of heat, humidity, and dust on the travelling public.

Of all the electric energy generated at the power stations, eighty-five per cent. is dissipated in the form of heat—in the stopping of trains, in the action of the friction of the brake shoes upon the wheels, the pounding of the wheels on the rails, the working of the motors and other such mechanical evidences of heat, all of which are supplemented by the heat from the electric lights, and the body heat of passengers, etc.

With one thousand trains per day operating on the city railway, the conversion of electric energy to energy of motion, on the two sections underground, *viz.*, from Liverpool Street, Harrington Street on the west, and Liverpool Street to Macquarie Street on the east, would approximate the heat liberated by burning ten tons of coal each day. The body heat of passengers must also be taken into account. If eight hours of the twenty-four are spent in complete rest, the heat produced by the average worker in twenty-four hours is equivalent to the heating value of one pound of coal. Although each passenger will only be travelling for a comparatively short period of time each day, the system will ultimately transport several million passengers daily, so the body heat of passengers is a factor in the heating of the air in subways.

In London, New York and elsewhere, the temperature of the underground railway varies with the season, but increases regularly year by year. On the Bakerloo railway, London, temperature readings are taken at 8 p.m. at the various stations: Baker Street, Regent's Park, Oxford Circus, Piccadilly, Trafalgar Square, Embankment, Waterloo, Westminster Bridge Road and Elephant and Castle. Over a period of six years the mean average temperature increased by 7.2 degrees Fahrenheit, because heat is generated in the subways by the traffic faster than the lining of the subway and the surrounding soil can conduct it away.

The same will happen in Sydney, but to a much greater extent, as the summer is hotter, and Sydney never experiences the low temperatures which prevail in London in the winter, and which counteract to some extent the tendency of the subways to become hotter each year. More particularly in summer weather, the air in the subways of New York, London and elsewhere is objectionable on account of the heat, the air has a peculiar odour and for this reason people prefer to travel in the open air when possible. In New York in summer time, the traffic on the elevated railways materially increases because passengers prefer the slower open-air railway to the underground.

In London, where climatic conditions are less enjoyable than Sydney, many people prefer out-door travel by motor omnibuses to that underground by railway, notwithstanding the superior speed and frequency of the latter service.

Humidity is a very important factor in ventilation, as the disagreeable odours in enclosed spaces are always more or less noticeable in a humid atmosphere. The odours in subways are largely due to operating conditions, the oil and grease used in lubrication, the motors, hot boxes, hot brake-shoes and fuses, all contributing to render the tunnel atmosphere far less agreeable than the open air. Sydney is nearer the equator than any city operating underground electric railways; its summer and winter temperatures are higher, whilst its humidity is greater, and in these cities, according to public opinion based on the testimony of the senses, the air in the subways is unsatisfactory, especially during the summer months.

And now a few words about dust. A peculiar kind of black, metallic dust exists in all subways operated by electric traction, and is undoubtedly due largely to wear and tear of the machinery of the trains. The amount varies in different roads according to the number and speed of the trains and other circumstances, but is always present in easily detectable quantities. The abrasion of the ballast under the sleepers also forms dust.

"In the Paris subway the average quantity of dust produced is one thousand four hundred pounds per mile of subway per month, and in some parts of the system it is sometimes in excess of this amount. An effort is made everywhere to remove the

dust, for it is regarded as disfiguring the linings of the subways, and more important still, is injurious to health, and is inflammable. It has caused difficulty with electric insulations both in London and Paris. The dust is generally removed from the walls by hand. One of the objects of sprinkling the platforms is to lay this dust."

"In the New York subways the loss in brake-shoes has amounted to one ton per mile per month. The iron, so ground up into powder, and so deposited, obviously either remains in suspension, or is too heavy and falls to the floor of the subway, there to remain until the train sets it in motion. When examined microscopically, the dust is found to be comprised of particles of many substances, conspicuous among which are flat pieces of iron. By comparison, it has been found in the New York subways, that magnets hung up in the subway, collected more iron than magnets of the same size and strength hung up in an iron foundry, or a dry polishing and grinding establishment. In the New York subways there is fifty per cent. more dust than in the outside air. The rapid passage of trains raises up the dust from the ballast and side walls."

To reduce dust to a minimum, Sydney's electrical railways will not be ballasted where underground, the bottom of the subway will be constructed of concrete and the sleepers bedded thereon. Drains will be formed in the concrete, so that the subways can be hosed down, and the dust, etc., washed into these drains. This hosing down will both clean and cool the sections underground and ventilation will be provided by shafts and fans. The air drawn into the subways will be water sprayed to cool it and remove the dust.

In designing and locating this system of metropolitan railways, the cost of construction, and the cost of maintenance and operation were naturally the main considerations, but the comfort, health and convenience of the travelling public have also been kept in view. Owing to the climate of Sydney, common sense suggests at once an open air location, so that passengers may enjoy the maximum of fresh air and sunlight, and the minimum of heat, objectionable odours and dust. Any æsthetic objections to an open air location have been swept aside in the design: there will be no unsightly overhead steel structures as in New York and Chicago. Where above ground the railway will be constructed of concrete arches, masonry faced. Each portion has been specially studied and it can safely be said that it will be a beautification, not an eyesore, of the city.

The cost of the city railway as located will be quite one and a half million pounds less than if the location had been wholly underground, as recommended by the Royal Commission on the "Improvement of the City of Sydney and its Suburbs" in 1909, whilst the public will travel under much more pleasant conditions.

The efficiency of the system, *i.e.*, the number of trains per hour which can operate is quite twenty per cent. greater than if the location had been wholly underground, whilst owing to the easier grades the cost of operation will also be less. The railways will be operated from overhead construction with direct current at one thousand five hundred volts.

The system of electric railways for the metropolis, outlined above, was designed by the writer, after a visit to the principal cities of the world operating electric railways. With full knowledge of all previous proposals, the problem was studied from every aspect. The scheme is a comprehensive one and when carried into effect, the writer ventures to think will meet with the approval of the travelling public.

SUCCESS

It's doing your job the best you can,
And being just to your fellow man;
It's making money, but holding friends,
And staying true to your aims and ends;
It's figuring how and learning why,
And looking forward and thinking high,
And dreaming a little and doing much;
It's keeping always in closest touch
With what is finest in word and deed;
It's being thorough, yet making speed;
It's daring blithely the field of chance
While making labour a brave romance;
It's going onward despite defeat
And fighting staunchly, but keeping sweet,
It's being clean and it's playing fair;
It's laughing lightly at Dame Despair;
It's looking up at the stars above
And drinking deeply of life and love;
It's struggling on with a will to win,
But taking loss with a cheerful grin;
It's sharing sorrow, and work, and mirth,
And making better this good old earth,
It's serving, striving through strain and stress,
't's doing your noblest—that's Success.

QUEENSLAND

PICTURESQUE CENTRES IN THE PROSPEROUS NORTH

ONE of the most notable features of the long coastline of Queensland is the number of important ports which serve the great inland districts. Unquestionably the State owes its decentralised settlement chiefly to this fact. It is a difficult matter to prevent centralisation where Nature has strictly limited the number of outlets that are available for commerce, but when the opposite is the case it invariably spells prosperity and progress for the fortunate country or State.

A picturesque little beach in Northern Queensland.

Townsville.

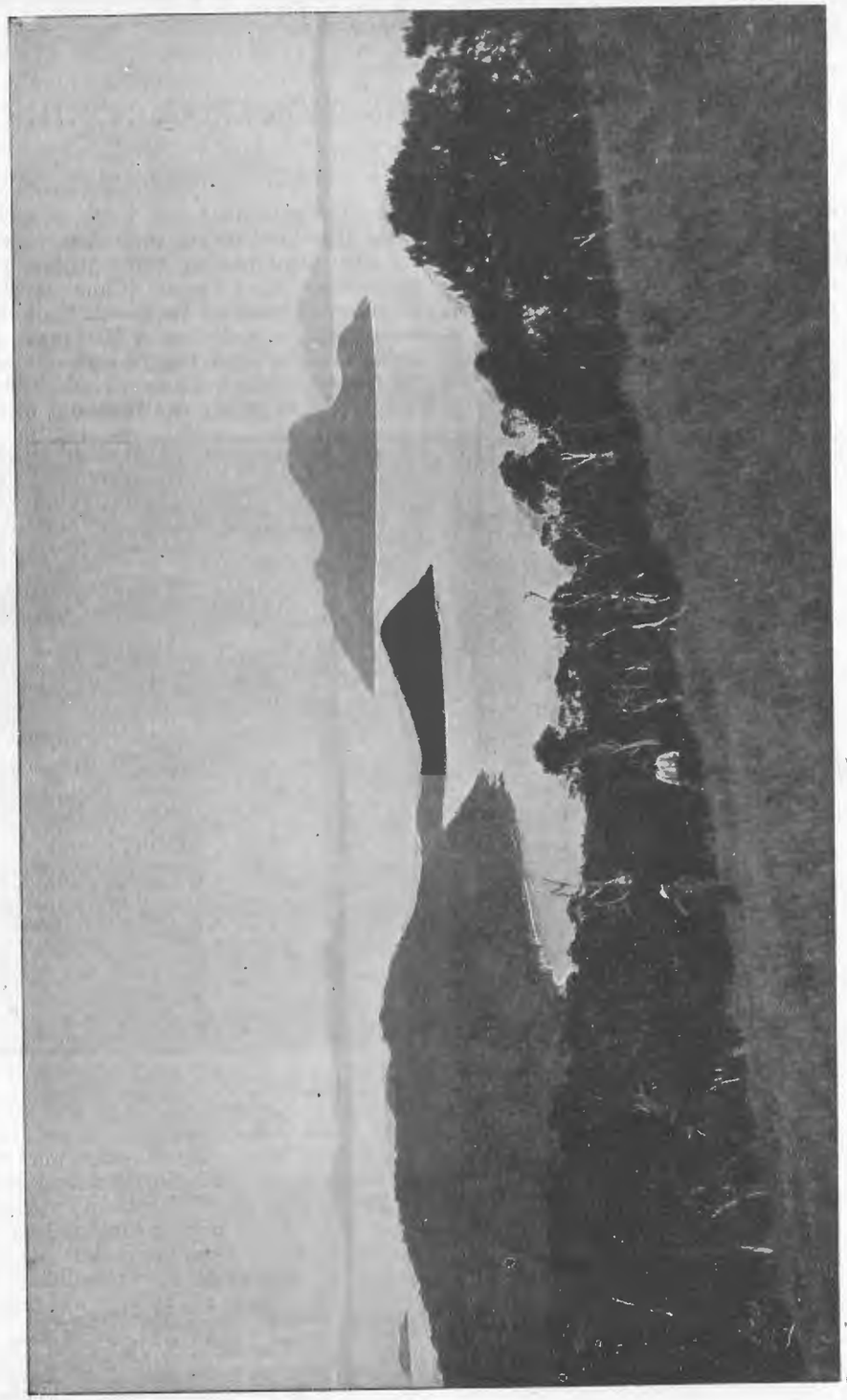
Townsville, on the shores of Cleveland Bay, is one of the principal towns of North Queensland, and as a shipping centre is of considerable importance. A substantial concrete pier extends almost a mile out into the Bay, and alongside this vessels of fifteen thousand tons may berth in safety.

Sea travellers obtain their first view of the town after passing three distinct promontories—Cape Upstart, Cape Bowling Green and Cleveland Point—on the northward trip from Bowen. The town lies beneath the dark-red, rugged cliffs of Castle Hill, a remarkable landmark which rises to a height of nearly one thousand feet.

The place was named after a seafaring man, Robert Towns, whose vessels were the first to open up trade in Cleveland Bay. Mr. Towns was identified with the progress of the district for many years, and as its Parliamentary representative was instrumental in obtaining the expenditure of considerable sums of money on public works.

The Gold Rush.

When gold was discovered at Ravenswood, Cape River and Charters Towers, the



Lindeman Island (near Mackay), looking north. Lion Island is seen in the middle distance.

port of Townsville immediately became a busy centre. Later on a rush set in to the Palmer goldfield, further north, and it is not surprising that with a record gold yield being obtained the days that followed were marked by reckless spending which, like most other "boom" periods, was followed by the inevitable reaction.

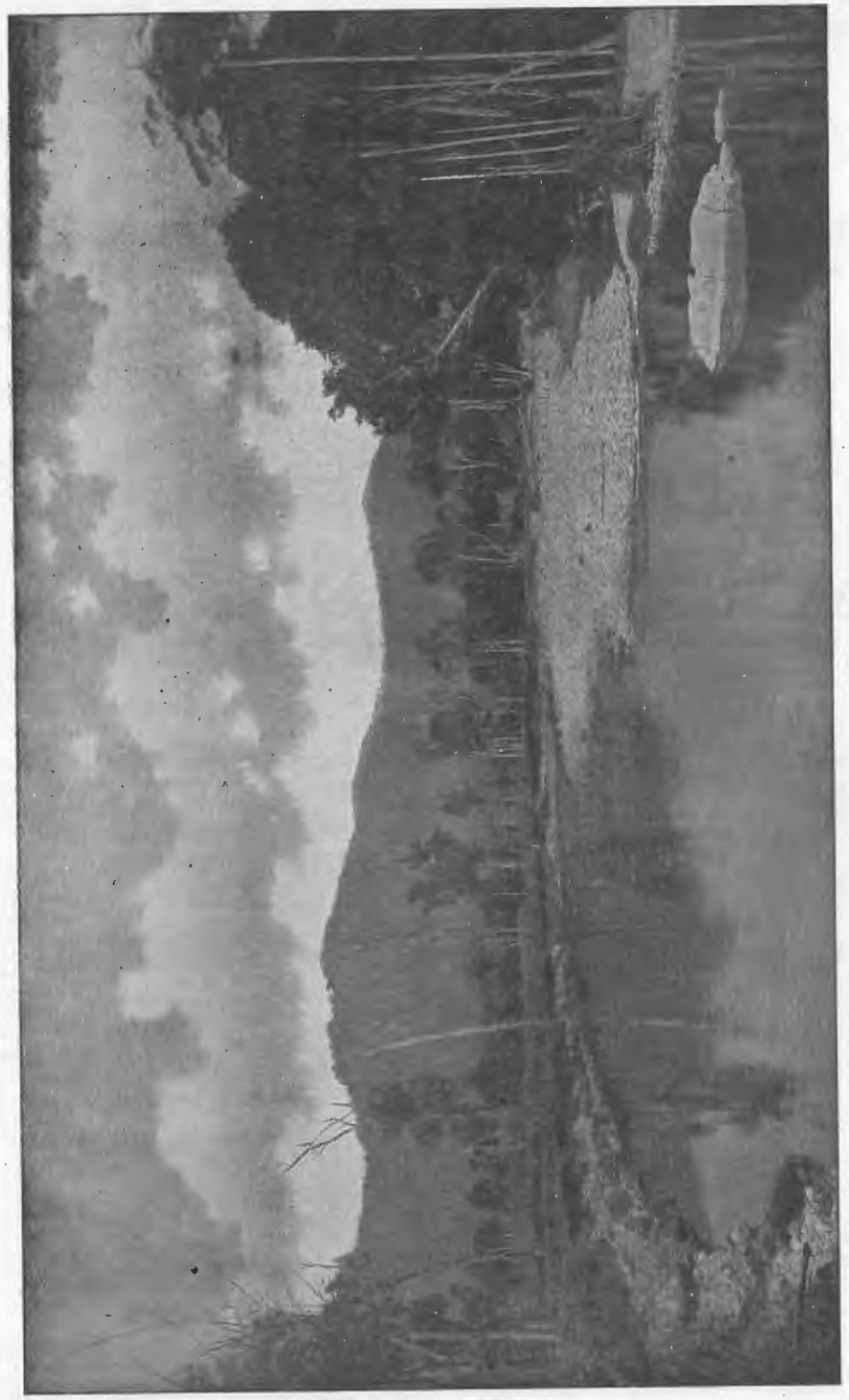
Life was full of excitement and danger for those who joined in the rush to the mineral fields. The blacks were numerous along the route and they strongly resented the intrusion of the "pale faces." Even when the fields were safely reached there were still many privations to endure, food supplies being very uncertain, and even when obtainable they were so dear that only those who were striking it lucky were able to purchase all they required. As is the case with the majority of "gold rushes" the fever subsided after a time, but Townsville, as the outlet for the huge pastoral area which lay behind, continued to grow. A steady stream of mineral wealth still passes through the port, and in addition sheep, cattle, wool and other products are shipped away in large quantities.

The town itself boasts wide streets and many handsome buildings. For three quarters of the year the weather is almost invariably fine, and the majority of amusements, including picture shows, are held in the open air. A tidal creek with waters of crystal clearness runs parallel with the main street, and is a never-ending source of amusement for the younger male population. *Bêche-de-mer* schooners with their crews of Japs and Malays beach on the shores of this creek for their frequent overhaul. To the right of the bay stretches a long arm of mountainous land which extends to the lighthouse on Cape Cleveland. To the left lies Cape Palarenda, the quarantine station, and immediately opposite Magnetic Island. Between the two latter, leading towards the north, is the beautiful Hinchinbrook Channel. On a clear, calm winter's day, of which there are many in Townsville, there is no more beautiful view than looking north over the Hinchinbrook. Away in the blue distance stretches island after island till the furthest ones seem but shadows hovering uncertainly over a misty sea.

Avenue of cocoanut palms, Eimeo, Mackay district, Northern Queensland.

Local Industries.

One of the most important industries of the district is represented by the Australian Meat Export Company's works at



Finch-Hatton Creek (Mackay district). Clark Island is in the background.

Alligator Creek and Ross River, which employ large numbers of men. These works treat as many as one hundred and fifty thousand head of cattle each season. Breweries, timber mills, a soap factory and various transport services are also in active operation. When sugar is arriving in on boats from the north, and by train from the lower Burdekin district, and live stock, wool and minerals from the interior, the wharves and railway station present a busy sight.

Pleasure Resorts.

As might be expected, the people of Townsville are keenly active in their pursuit of pleasure and recreation. Favoured by a long summer and mild winter they spend most of their spare time in the open air, and on holidays and week-ends the two pretty beaches of Mandalay and Arcadia, reached by motor launches, are liberally patronised. On Magnetic Island, which is an ideal tourist resort, there are also two pretty picnic grounds.

To visit Cape Palarenda, at the base of which the beautifully situated quarantine station overlooks Rose Bay, one has the choice of an excellent run by vehicle or motor car, or a pleasant trip by motor launch.

In the city the Strand beach extends for miles, and is associated with a spacious well-kept park on which band concerts are regularly held. A well laid out showground, sports ground, and racecourse figure amongst the city's other attractions.

Hinchinbrook Channel.

In travelling from Townsville to the Herbert River estuary by one of the small coastal steamers, the beautiful Hinchinbrook Channel is traversed. Haycock Island, with its graceful contour and arboreal covering, stands guard at the entrance to the channel, on each side of which is a rugged range of mountains densely timbered down to the water's edge. Usually the waters of the channel are as peaceful as an inland river. Years ago, when wild blacks frequented the locality, travellers up this passage had to keep a bright lookout in order to avoid their hostile attentions.

Near view of the weir, Burdekin River, Northern Queensland.

Lucinda Point, the port of Herbert River, is the point of embarkation for travellers who come in by trams from the sugarlands of the Ingham district. It is

likewise a famous fishing ground, and fleets of motor boats frequently visit the locality and secure good hauls.

Eight miles up the Herbert River the little town of Halifax nestles amongst fertile hills, and some distance further on Ingham, the chief town of the Lower Herbert district, is reached. It is a prosperous district, with sugar-growing as its chief industry. Eventually these parts will be linked up with Townsville by the great North Coast railway, which will some day reach the State's western border and junction with lines from the Gulf and Northern Territory.

Charters Towers.

Charters Towers at one time enjoyed the distinction of being the most important gold-mining centre, and at the same time the most social and musically cultured town in the northern State. Even to this day its life still runs in a pleasant stream, and the residents of the outlying districts travel long distances to attend the various racing fixtures, musical and other forms of entertainment which enter so largely into the life of the town.

The public gardens in the centre of the town are one hundred acres in extent, and are tastefully laid out with a rotunda, aviaries and a small zoo.

The town's water supply is obtained from the Burdekin River weir. It is a broad-flowing, picturesque stream and is regarded as one of the show places of the town.

A School of Mines, maintained by the State, has long been a feature of the local educational system, and although a large number of disused chimney stacks and the surface equipment of deep shafts speak eloquently of the district's huge mining activities in bygone days, there are still a number of mining interests which assist in keeping up the prosperity of the place.

Charters Towers is in every sense a white man's town. Unlike some other centres of Northern Australia, where Asiatics form a portion of the business community, the whole trade of the town is in the hands of Australians and Europeans. It is fitting that it should be so in a place where climatic conditions are ideal for maintaining racial purity.

Artesian Bore on Coongoola Station, Cunnamulla district, South-western Queensland.

MOUNT PLEASANT

HISTORIC SPOT NEAR BATHURST

By C. GREGORY

The old Mount Pleasant home, built at the time of the convict chain-gangs.

WHAT might be described as the most spectacularly historical spot in western New South Wales is Mount Pleasant, about three miles north of the picturesque city of Bathurst. Mount Pleasant is directly associated with the original discovery by white man of the rich and expansive areas beyond the Great Dividing Range, and is an indirect link in the histories of Old England and Young Australia. It was from the top of the rise that Surveyor-General Evans gained an impressive and inspiring view of the new country further west after he had crossed the great mountain chain in furtherance of the explorations of Blaxland, Lawson and Wentworth. And it is at the identical spot that the late Major-General Stewart, who fought against Napoleon, and who, for three weeks, filled the office of Governor in New South Wales, is buried.

While the earliest colonists were engaged in their own particular trials in what was then relatively unknown New South Wales, Major-General Stewart was engaged in the Peninsula Campaign. He was one of the five officers to survive the heavy defeat of the 3rd British Regiment of Buffs at Busaco. He was also in service at Aubhhera when Napoleon's forces took the Buffs in the rear and accounted for all but fifty men. Stewart was largely responsible for the turning of the tables and the recapturing of the whole of the prisoners.

After further service on the Continent Major-General Stewart went to the West Indies, and later, when war with the United States of America broke out, his force was taken to Canada. After peace the Buffs re-crossed the Atlantic for service against Napoleon, who in the meantime had escaped from Elba, but the battle of Waterloo was decided nine days before Stewart's force arrived. Portion of the old unit, with Stewart still in command, sailed for Sydney by the *Asia,* arriving in April, 1825, and as a reward for his military services the old warrior was allowed to select three thousand acres of land in Australia. The road over the mountains to the west had just been completed, and Major-General Stewart journeyed to Bathurst and chose his land after he had ascended Mount Pleasant—so named by Explorer Evans—from which a delightful outlook is obtained. The mountain rises

BACK AGAIN AT CHRISTMAS

By RODERIC QUINN

For all folk who love to roam
The roads go south and east,
And the roads go north and west,
But the road that tires the least
And the road they like the best,
When the world no longer lures,
Is the road that leads to home.

Back again at Christmas,
Round the board they sit—
Old and young together;
Oh, the joy of it!
Rambler, Ranger, Rover,
Met again at last;
Memories telling over—
Stories of the past.

For all folks who love to roam
The ships go east and south,
And the ships go west and north,
And they leave the harbour mouth
And they gaily venture forth;
But the ship that sails the best
Is the ship that's bound for home.

Home again at Christmas,
Done with wave and wind,
Old and young together.
Oh, but Fate is kind!
Years ago they parted:
Let them be as then—
Gay and kindly-hearted,
Clasping hands again!

For all folks who love to roam,
The star of wonder burns
And the lure of fortune beams;
But the heart forever turns
To the lamp of Love that gleams
Through a window far away,
Where Hearts call the wanderer home.

Met again at Christmas.
Fate has joys to give,
Old and young together—
Sweet it is to live!
Rambler, Ranger, Rover,
Back from far-off climes—
Singing old songs over,
Toasting by-gone times.

MOUNT PLEASANT

(Continued.)

abruptly several hundred feet from the surrounding undulating country. The old pioneer purchased twelve thousand additional acres at a nominal figure, and the estate remains practically intact to day, though the price of the land is hundreds of times its original market value.

The old "Stewart's Police" that figure prominently in the earlier records of Sydney were founded by the subject of this article, who, at that time, had the office of Lieutenant-Governor. Stewart went to India in 1829 and assisted in quelling native revolts in the exact localities mentioned in the present-day cables relating to Indian unrest. Meanwhile his wife and family were still in Scotland, but the General's agent "packed them into a small boat of three hundred tons"—as the family records put it—and after a voyage of seven months they landed in Sydney. In 1833 the whole family treked west and lived in the aggresively formal looking building that still stands, surrounded by substantial, rough concrete walls.

Major-General Stewart died in 1854 and his remains were carried by bullock team to the mountain top. His son, the late Mr. J. H. Stewart, who died only last year, afterwards built the palatial granite building that is still occupied by the historic family.

You may succeed when others do not believe in you, but never when you do not believe in yourself.

There is only one place in the world where you can live a happy life, and that is inside of your income.

TARONGA PARK

SYDNEY'S WONDER ZOO

THE fame of Taronga Park—the picturesquely situated Zoological Gardens on the northern side of Sydney Harbour, has extended far beyond the bounds of New South Wales. To the teeming population of the metropolis it is an ever-present source of interest and amusement, while few out of the thousands of country visitors who flock to Sydney each year would regard their holiday as complete without a visit to this picturesque spot.

It matters not that it has been inspected before; there seems to be always something fresh to interest and amuse, and what more delightful spot could be chosen to spend a peaceful afternoon than where one may gaze out over the beautiful waters of Sydney Harbour, dotted with craft of all sizes and shapes, and feel the cool, delightful breezes that blow in the Pacific Ocean. Here, too, one may wander, as fancy dictates, amidst quiet, shady nooks and breathe the true atmosphere of rest and peace. Then there are the birds and animals—a never ending source of interest and amusement; the handsomely laid out gardens which delight the eye, and the spacious refreshment rooms replete with all the good things one can appreciate so thoroughly in such delightful surroundings.

This is the atmosphere of Taronga Park, and no more eloquent testimony of its countless attractions could be forthcoming than a study of the progress made since its establishment a few years ago.

The seal pond, Taronga Park.

On April 24, 1912, the Government dedicated about forty- three acres of land at Bradley's Head for the construction of a Zoological Gardens, and on the twenty-second of the next month the following gentlemen were appointed trustees:

The Hon. Fred Flowers, M.L.C. (present Chairman of the Trust), Wm. Jonathan Green, Henry Clement Hoyle, M.L.A., Charles Hedley, Albert E. Nash, Alfred Spain, Robert Henry Todd, M.D.

The task of constructing Taronga Park, now recognised as one of the finest Zoological Gardens in the world, and the only self-supporting one, was commenced by the Trustees in August, 1912. A contour of the grounds and a model to scale were the first steps towards the formation. Anyone conversant with the nature of the ground at Bradley's Head will understand the gigantic task of clearing the undergrub, which, when completed, was followed by a prepared plan of the paths and roads.

Perhaps it would be interesting to mention at this stage that the first works commenced were the enclosures for the monkeys, the elephant house, hippo. and seal ponds, and the avaries.

Up to February, 1915, the Trustees were responsible for construction, then the responsibility was taken over by the Public Works Department. From this date it was carried out on a much larger scale, and on October 13, 1916, the grounds were officially opened to the public by the then Premier of New South Wales, the Hon. W. A. Holman. Construction was still carried on by the Public Works Branch after the opening, but operations ceased a short time before Easter, 1917, leaving a number of works, amongst them being the refreshment room, uncompleted. However, by arrangement with the Government, who supplied a portion of the amount needed to complete this important building, the work was shortly afterwards finished.

One of the main items left undone by the Public Works Department was the construction of the roads. This was undertaken by the Trustees, who realised what

This photograph shows part of the elephants' and monkeys' enclosures at Taronga Park Zoo.

a direct benefit would accrue, and a general asphalting scheme was decided upon, with the result, that excepting a few less important paths, Taronga to-day is a place of asphalted footways, making walking easy both to young and old.

The health of the animals has been considered in every direction, and the beneficial effects of the improvements carried out, coupled with the fact that the location of the Park is a naturally healthy one for birds and animals is demonstrated by the fact that during the past five years they have thrived exceedingly in their new home. The mortality has been much less than at their old quarters at the Moore Park Zoo. Since the site was moved to Taronga the value of the animals has been increased from approximately £6,000 to double that amount. A rule has been made that no animal or bird be purchased unless it can be comfortably housed.

It is confidently claimed that not only does Taronga Park rank high as a zoological exhibition, but that the flower gardens, lawns, and the generally picturesque lay-out of the ground, make it a beauty spot well worth visiting at all times. When considering the rocky principle of gardening which the Trustees have adopted, a particularly fine piece being above the seal pond, the banks of the River Yarra in Melbourne have very likely been kept in view. Both places, owing to their natural surroundings, are well adapted for such style of horticulture.

From a commercial point of view, Taronga is a paying proposition. Out of the surplus available from the funds derived from turnstile takings, refreshment room, and other sources of revenue, the Trustees have expended up to the present approximately £10,000 on improvements. When it is considered that the other Zoological Gardens in the Commonwealth are maintained by grants from their respective Governmnts, and similar institutions in other parts of the world are similarly maintained, or receive funds from public membership in addition to Government grants, the Sydney Zoo may justly feel proud that it is self-supporting.

This fact is the more creditable when it is remembered that public schools, all charitable institutions, ragged and poor schools, soldiers and sailors are admitted free. In addition to the above list, members of the Royal Zoological Society, the controlling body of the old Moore Park Zoological Gardens, are also admitted free, under an arrangement whereby they are permited to dispose of tickets for themselves and members of their families, which virtually constitutes a direct subsidy of £300 per annum to this purely scientific institution.

From January 1, 1917, to the end of September, 1921, a period of four years and nine months, 2,444,470 persons passed through the turnstiles, being a yearly average of 514,625. These figures do not include the free list of the Park, which is admittedly a large one. It is interesting to note that of these attendances the proportion worked out at four adults to one child. It might be stated here that not one serious accident occurred during the whole of this period.

Dealing with the figures for the year ending 1920, the Trust received £17,000 from the turnstiles and £13,000 from the refreshment business, making a total yearly turnover of £30,000.

From this total it was necessary to expend nearly £4,000 on food for the animals alone, whilst the wages paid amounted to £12,714. These are perhaps the main items of expenditure, but after the payment of the many other charges connected with an institution of this kind, the Trustees concluded their financial year with a substantial credit balance.

Picnic parties to the Park have many ideal spots for their enjoyment. They can obtain the whole of their requirements on the grounds, and need not worry about bringing any necessities from Sydney. The refreshment rooms consist of a spacious building, conveniently situated, and capable of seating over three hundred persons simultaneously. The whole of the commodities supplied in the rooms are made on the premises by the Trust's own staff. In addition to the main refreshment rooms, shops are erected at different portions of the grounds where light refreshments are available.

It is interesting to note that the present huge catering business had its beginning in a small room at the top entrance gates. The plant necessary to carry on operations was hired for a time, but the profits soon grew and by degrees the Trust purchased its own plant. The large pavilion refreshment room was opened at the Easter of 1917, and from the day the business was

transferred there it commenced to grow more rapidly than ever. Extra accommodation had to be almost immediately provided, and the wisdom of the Trustees' action in giving attention to this side of the business was evidenced by the handsome profits which were soon available to be wisely expended on providing for the education, comfort and convenience of the ever-growing army of visitors.

Of all the animal attractions at the Park undoubtedly the most popular is the female elephant, Jessie, who is a great favourite with the children. She was a well-known figure at the old Moore Park Zoo and has now been in harness for over forty years. During 1920 Jessie carried approximately thirty-seven thousand adults and children on "joy-rides" around the grounds.

Great difficulty has always been experienced in securing elephants, which are, of course, exceptionally valuable animals. Originally they were obtained from the Burmese Government, but the latest purchase of four baby elephants was made

A view from the picnic reserve, Taronga Park, looking down Sydney Harbour, showing Bradley's Head.

from the Indian Government and they are now awaiting shipment at Calcutta. They are being brought out by special Indian attendants, whose services the Trustees hope to retain until the animals become thoroughly acclimatised.

The monkey tribe is also obtained from India, likewise the tiger, leopards, and pandas, which have only recently been received. Of the lions, which number thirteen, one was born at Taronga, and was fostered by a British bulldog. The remainder came from different parts of the world.

The bird section, which is one of the most interesting in the whole Park, has recently received a number of valuable additions in the shape of birds of paradise, pigeons, and other varieties of the feathered tribe which were secured by the head game-keeper in Papua. Another of the Trusts' collectors is at present in the Northern Territory obtaining specimens of bird-life there for the interest and education of the patrons of Sydney's wonder zoo. The specimens will include a large number of painted finches, and it is expected that they will be available for inspection by the thousands of visitors who will frequent the Park during the coming Christmas holidays.

The Trustees have experienced the happiest results from sending out their own collectors and they have invariably found that the most cordial co-operation has been extended by the authorities of the various countries where it is desired to secure specimens.

Quite recently a Board of Control was formed under which the Zoological Trusts of Melbourne, Sydney and Perth combined with the object of supplying the needs of similar institutions in other parts of the world. This arrangement is likely to prove a highly profitable one, which means that additional funds will be available for the improvement of the various Zoological Gardens concerned. The first consignment of animals forwarded by the Board under this arrangement left during September. The authorities at Regent's Park, in London, arranged to take care of the animals until they were disposed of to the different British and Continental Zoos. Few places are easier of access than Taronga Park. A regular boat service from Circular Quay is available for visitors from the city side, whilst the whole of the North Sydney district is served by an excellent tram service. There is nothing lacking in the way of interest, education and convenience for the ever-growing army of visitors to what may justly be regarded as one of Australia's national play-grounds.

AERIAL ACTIVITY IN NEW ZEALAND

MANY LONG FLIGHTS MADE

By HENRY BATESON, Our Special New Zealand Correspondent

DURING the past month aerial activity in New Zealand has been very marked and October, 1921, will go down in history as one of the most important periods in the development of aviation in the Dominion.

First of all the New Zealand Flying School's supermarine flying boat, a description of which appeared in the November, 1920, issue of *Sea, Land and Air,* pp. 509-11, flew from Auckland to Wellington in five hours six minutes. Previous to this the best long-distance flights accomplished in New Zealand were the late Captain R. Russell's non-stop flight from Wellington to Wanganui and from Hastings to Palmerston, and Captain Euan Dickson's first trip across Cook Strait.

Subsequently a *D.H.9,* belonging to the New Zealand Aero Transport Company, which has its headquarters at Timaru, flew from Invercargill to Auckland in eight hours fifty-three minutes actual flying time. The flying time for the Wellington-Auckland stage of the journey, about three hundred and thirty miles, was three hours thirty-six minutes. The same 'plane has since made the return journey.

In addition to these two pioneer flights an *Avro* machine belonging to the New Zealand Aero Transport Company flew from Invercargill to Wellington and has been carrying out passenger flights from Lyall Bay for several weeks. Another *Avro,* owned by the Canterbury Aviation Company, has flown from the Sockburn aerodrome, just outside Christchurch, to Wellington, landing at Hutt Park. After remaining there for a few days it went up to the Wairarapa district.

The Flying Boat's Trip.

The big "Supermarine" flying boat which made the trip from Auckland to Wellington in just over five hours, was piloted by Mr. George Bolt, the chief pilot and instructor of Messrs. Walsh Brothers' school, and he had with him as passengers Mr. Leo A. Walsh and Mr. R. J. Johnson (mechanic and works manager for the school). The 'plane left Auckland at 7 a.m., and followed the coastline to Kawhia, ninety-six miles away, where the first stop was made, the trip occupying one hour thirteen minutes. After half an hour's stay the party set out again along the coast. The weather was fine, but the visibility poor. Originally it was intended to fly across land, but with such poor visibility the safer course of the coast line was followed. Cape Egmont was passed at 10.7 a.m., but the mountain was quite obscured by clouds, and the airmen had no chance of taking any photographs. Patea and then Wanganui were reached. At the latter city a stop was made, the 'plane landed at Castlecliff and taxied up to the bridge. The distance from Kawhia to Wanganui is about one hundred and ninety miles and this journey occupied two and a half hours.

When Wanganui was left at 1.45 p.m. light rain began to fall, and there was a strong southerly breeze blowing. This was met with throughout the rest of the journey, but the flying boat landed on Wellington Harbour at 3.8 p.m.

For several weeks the "Supermarine" did a lot of passenger flights and there seemed to be no end to those desirous of going for a "joy-ride." Considering the strong opposition in the *Avro* operating from Lyall Bay and, for a few days, the one at the Hutt, it was surprising that the Auckland visitor should have done such a lot of trade. It says a lot for the citizens of Wellington and the interest they show in aviation.

From Invercargill to Auckland.

The *D.H.9* left Invercargill on October 24 with Mr. T. C. Mercer (manager of the Company) as pilot; Mr. R. L. Wigley (managing director) and Mr. W. H. P. Fleming (a director) as passengers. Leaving at 4.57 a.m. the machine was over Dunedin at 5.55 a.m., and arrived at Timaru at seven o'clock. It had been intended to make the whole journey from Invercargill to Auckland in one day, but the weather reports from the north were so bad that this plan was dropped.

The machine left at eight o'clock next morning, however, and arrived at Kaikoura at 9.55. Leaving again at five past eleven. Blenheim was passed over at 11.50 at a height of six thousand feet. The journey across Cook Strait occupied eight minutes and at 12.25 p.m. the *D.H.9* landed at Trentham, where a small party, including the Secretary to the Air Board, Mr. Mallard, the pilot of the machine stationed at Lyall Bay, and others, were waiting for the pioneer.

The distance between Invercargill and Wellington is about five hundred and twenty-five miles, which the machine covered in five hours eighteen minutes actual flying time—a very good performance, indeed.

The party left for Auckland at two o'clock, called at Hawera *en route,* spent a short time there, and landed at Auckland at 6.8 p.m.

The total petrol consumption from Invercargill to the machine's destination was seventy-four gallons.

The following table records a summary of the log-book for the trip:

October 24.—Left Invercargill 4.57 a.m.; over Dunedin 5.55 a.m.; arrived Timaru 7 a.m.

October 25.—Left Timaru 8 a.m.; over Ashburton 8.28 a.m.; over Christchurch 8.58 a.m.; arrived Kaikoura 9.55 a.m.; left Kaikoura 11.5 a.m.; over Blenheim 11.50 a.m.; over Wellington 12.15 p.m.; arrived Trentham 12.25 p.m.; left Trentham 2 p.m.; over Wanganui 2.41 p.m.; arrived Hawera 3.25 p.m.; left Hawera 4.5 p.m.; arrived Auckland 6.8 p.m.

It is interesting to compare the times made between various points by the *D.H.9* from Timaru with those made by Captain Dickson and the late Captain Russell. Captain Dickson made the trip from Christchurch to Wellington in four hours forty minutes flying time, and the return trip in four hours nine minutes, while Captain Russell's time to Wanganui was one hour twelve minutes. The *D.H.9,* of course, is a larger and heavier machine and is fitted with a three hundred horse-power *Siddeley-Puma* engine. It made the trip to Wanganui in forty-one minutes and came from Christchurch to Trentham in two hours seventeen minutes.

Half-Yearly Return.

The following is the half-yearly return issued by the Air Board and covers all flying between April 1 and September 30:

	Passengers carried.	Hours flown. hr. min.	Approx. machine mileage.
N.Z. Flying School (Auckland) ..	294	188 44	12,149
Canterbury Aviation Co. (Christchurch)	1,052	75 10	4,621
N.Z. Aero Transport Company (Timaru)	2,110	198 3	13,511
Totals ..	3,456	462 0	30,281
*	*	*	

Mr. W. F. Massey, Prime Minister of New Zealand, speaking at a civic reception tendered to him on his arrival back from the Imperial Conference, said that he expects development of airships, but believes that at present a great deal of experimental work is necessary.

Some time ago there was a little trouble over an arrangement between the Government and the New Zealand Aero Transport Company, in reference to the Company being allowed, on certain conditions, to use a number of 'planes belonging to the Government. At the time, the arrangement was very hotly attacked in some quarters and the 'planes were said to be a straight-out gift by the Government. In the House of Representatives last month the Minister of Defence made an important statement bearing on the matter. He said that the Government had never offered aircraft to a Timaru syndicate as a gift, but that they had been loaned a number of 'planes on terms similar to those under which aircraft were loaned to the Canterbury Aviation Company and the New Zealand Flying School. He said that each Company has on loan three *D.H.9's* and six *Avros,* the values of which are at the Disposal Company's (England) prices: *D.H.9's,* £850 each, £2,550; *Avros,* £600 each, £3,600.

LONG-DISTANCE WIRELESS

NEW YORK TO AUSTRALIA: 10,000 MILES

PRESIDENT HARDING'S MESSAGE

"To be able to transmit a message by radio in expectation that it may reach every radio station in the world, is so marvellous a scientific and technical achievement as to justify special recognition. It affords peculiar gratification that such a message from the chief executive of the United States of America may be received in every land, from every sky, by peoples with whom our nation is at peace and amity. That this happy situtaion may ever continue, and that the peace that blesses or land may presently become the fortune of all lands and peoples, is the earnest hope of the American nation."
—WARREN G. HARDING.

ON the occasion of the opening of the most powerful wireless station in the world—known as New York Radio Central—the President of the United States sent the above message to every country in the universe.

Advice was received in Sydney by Amalgamated Wireless (A'sia.) Limited, on Friday, November 4, that a message would be radiated to the whole world at 3 p.m. (New York time) on Saturday, November 5. The company's managing director, Mr. E. T. Fisk, immediately made arrangements for its reception at various points in and around Sydney and Melbourne, and advised the Commonwealth and New Zealand coast stations to look out for the message.

In Sydney, special receiving apparatus was installed on board the steamers *Ulimaroa* and *Mataram* which were lying in the harbour. The well-known wireless experimenter, Mr. C. D. Maclurcan, was advised, and he also made arrangements to receive the message at his experimental station at Strathfield.

Instructions were sent to the Company's Melbourne office in Little Collins Street, and to their experimental station at Kooweerup (Victoria), to arrange for the reception of the message. The P. & O. R.M.S. *Narkunda,* between Melbourne and Adelaide, was also advised, as she is equipped with apparatus for long-distance reception.

Received in One-Eighteenth of a Second.

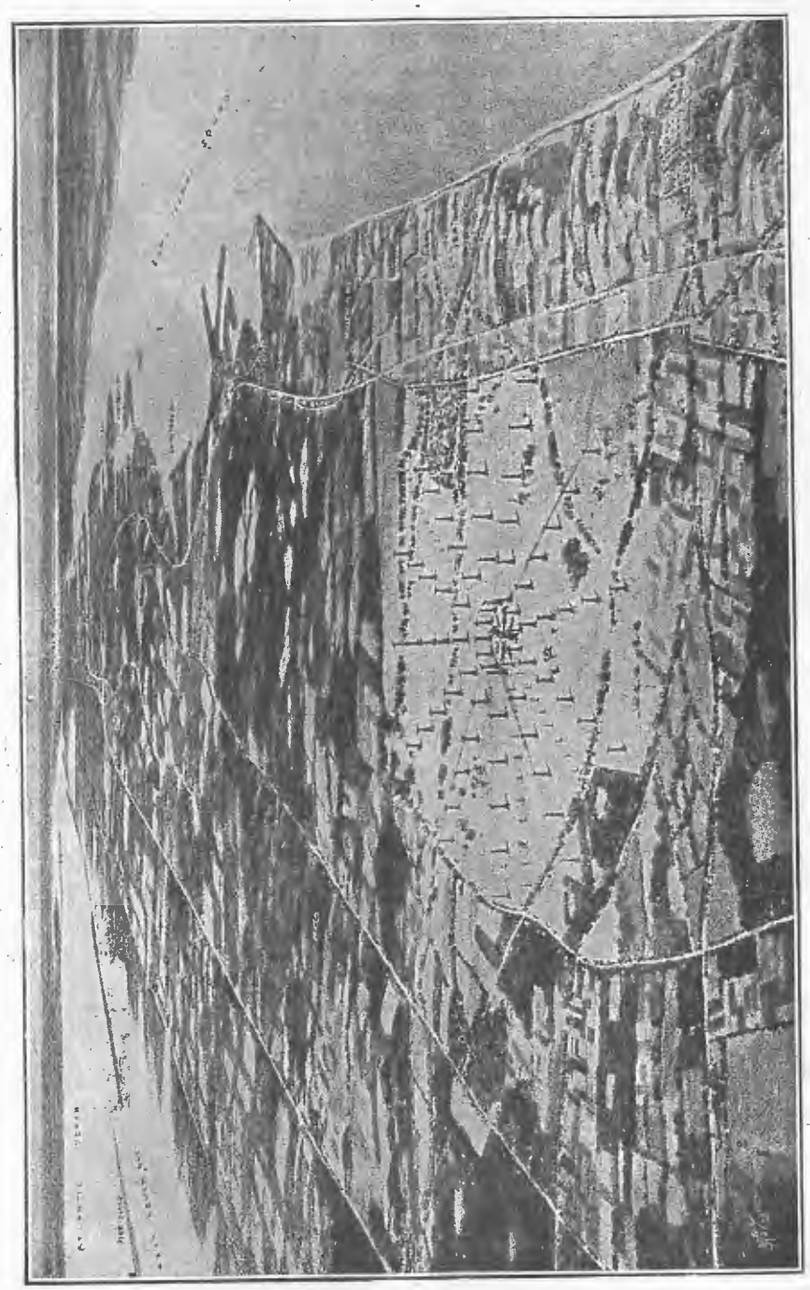
Actually the message was sent from a room in the White House, Washington, by President Harding closing a small switch which set automatic apparatus in operation. It was received simultaneously at all the points above mentioned in Sydney, Melbourne and New Zealand, and by the *Narkunda,* as loud and distinct as if it had come only a few hundred miles instead of ten thousand miles, the distance from New York City to Australia. As wireless messages travel at the tremendous velocity of one hundred and eighty-six thousand miles per second, less than one-eighteenth part of a second elapsed between the time the message was sent from New York and received in Australia.

The object of arranging for the reception of President Harding's message at so many points was to demonstrate the practicability of long-distance wireless communication.

The station from which the message was radiated—New York Radio Central—is situated on the north shore of Long Island, about forty miles from New York City, and was described in the September, 1920, issue of *Sea, Land and Air.* This high-power station has once again demonstrated that wireless is *the* medium for annihilating distance so far as communication is concerned.

Australia's Greatest Need.

A high-power wireless station similar to the New York Radio Central, that will enable direct world-wide communication with all countries is unquestionably Australia's greatest need. We are isolated more so than any other continent, especially in respect to communication. If the cables break, communication is severed until repairs are effected—in the meantime all messages are held up. Another disadvantage of the cable is the fact that messages have to be relayed so many times.



Panoramic view of New York Radio Central, from which President Harding, last month, sent a message to every country in the world. This station is situate on Long Island, forty miles from New York City. By means of long-distance control the station is operated in the heart of the city.

Long Island Sound is seen on the right of the illustration, the Atlantic Ocean on the left, and New York City in the centre at top.

For instance, a message from Sydney to London has to be relayed *five* times to reach Vancouver, and is then only half way! From Vancouver it is sent over Canadian land lines to Halifax, thence across one of the Atlantic submarine cables to a point in England from where it is transmitted over the land lines to its destination—London.

With a high-power wireless station in Australia—capable of direct communication to any part of the world—messages would be handed in at a receiving office in the city of Sydney, and the operator there, by means of long-distance control, would transmit the message into the heart of the city of London—one transmission!

Arrangements Made.

Amalgamated Wireless Limited have arranged to erect a high-power station in Australia and establish a world-wide direct wireless service from Australia. With such a service, Australia will benefit commercially, politically and socially, in fact it is almost impossible to assess the advantages which will be derived by the Commonwealth.

It is only through the limited means of cable communication linking this country with other parts of the world that our Press is insufficiently supplied with international news, and that Australia is not so well-known overseas as might be the case. We desire to know more about other countries and they wish to know more about us. Wireless will satisfy those desires.

From a commercial point of view, a world-wide wireless service is swift, reliable and cheap. When the Wireless Company establish their high-power station they will transmit all messages at one-third less than the existing rates. That advantage alone is of great consideration.

Another point of view is defence. Quick and reliable communication is absolutely essential in this respect. With only two cables linking this country with the outside world, there is nothing to prevent an enemy at sea cutting the cables and thus isolating us altogether. With wireless such a position could not arise. This was demonstrated during the late war when the Allies cut Germany's submarine cables. Germany then resorted to wireless, and by means of high-power wireless stations maintained communication throughout the whole of the war with the outside world. It might be mentioned that messages were regularly received in Australia during the war from Germany's wireless stations.

All countries are extending the use of wireless for communication purposes. Mankind the world over is "getting things done" in science and industry, and Australia, of course, must follow suit.

The Commonwealth Parliament will shortly deal with the matter of Australia's overseas communications—a right retained by Mr. Hughes at the Imperial Conference.

A thoroughly complete and modern long-distance wireless service and organisation—that will save £60,000 per annum—is what Australia needs. When that is in operation both internal and external isolation will be overcome.

Then, similar to New York Radio Central, Australia Radio Central will be able to communicate to any country in the world.

GILBERT ISLANDS

By A. J. SAWYER

A landing place in one of the Gilbert Islands. Vessels anchor out, passengers and cargo being landed in a surf boat. On the far side of the wave breaking right out a surf boat is just discernible.

THE remote Gilbert Islands are not so widely known as many other British possessions in the Pacific, but still they are of sufficient interest from an historical point of view as well because of the life and customs of the inhabitants to render them worthy of mention. The group consists of some two dozen islands which form the major portion of the Gilbert and Ellice Islands colony, of which Ocean Island is the local seat of administration. It is, however, practically governed by the High Commissioner for the Western Pacific in Suva. The few officials have a hard row to hoe, and are months at a stretch without fresh vegetables, meat or fruit. The absence of fruit seems paradoxical when one calls to mind tales of the beautiful blue Pacific with its groves and plantations, but as the Gilberts are merely coral strips with the highest point only ten feet above sea level and almost devoid of soil, it is easily understood.

Cocoanuts, baibai (a coarse species of taro), pandanus, an occasional jack-fruit (imitation bread fruit) and fish form the staple diet of the natives. Fish is usually eaten raw, in fact it is common to see one being eaten before it is quite dead.

Until about forty years ago the natives were extremely bloodthirsty, often fighting viciously amongst themselves. They fitted out large war canoes and made frequent raids on other islands. It is said that defeat was unknown to them, and they were certainly feared by their neighbours.

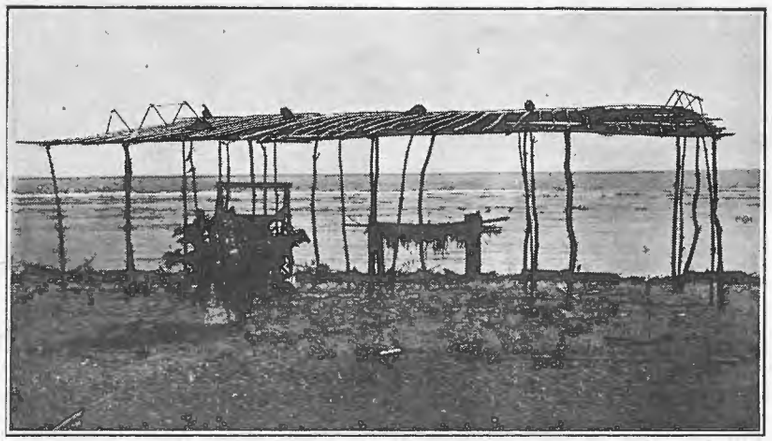
About four years ago the District Officer and the white trader were driven from one of the southern islands and sought refuge in a trading vessel. The natives will not tolerate a white trader on this particular island, but have decided to admit the Government.

Blackbirders reaped harvests in the early days, but now labour is not permitted to leave the colony.

The natives are pleasure-loving and jolly, but all have the gambling mania; so much so that they gamble money, goods, chattels and land away with impunity.

They have also been known to stake their children, and even themselves, "for a period of work!" One man actually gambled his wife away! On one occasion a raid was made on an island, and all those caught gambling, including the king and queen of the island, were sent to prison.

Each year a stipulated quantity of copra is made by the villagers and handed over to the Government. In this manner the taxes are paid. Splendidly made footpaths, ten to twenty feet wide, are to be found on the inhabited islands, and are kept in perfect condition by the natives. So keen is the popular desire for smartness that it is in most islands an offence punishable under native law by a fine of one shilling to pass by any leaf or refuse that may have fallen upon the roadway.



A resting place for frigate birds. These birds are trained when young by the Gilbert Islanders to catch fish for their owners.

Bicycles are eagerly sought; the possessor of a "baitiki" being much envied. To see a native riding about a village, wearing merely a grass girdle (reedie), and putting on his best airs, was, to visitors, ludicrous in the extreme, although to the admiring villagers it was quite the correct thing.

There is a quaint, and to some extent, an obnoxious custom rigidly adhered to, known as *puputi*. If one native sees another with some article which he is desirous of possessing, he just says "*Puputi ekai*" (I beseech you to give me that), and it is immediately handed over. However, the new owner may have only a temporary possession, as sooner or later somebody else will address the magic words to him. In this way many articles do a tour of the group. It is just as well that the custom does not extend to the whites.

Where there is no trading station the ship's supercargo goes ashore with a weighing machine and weighs the copra. The native is then given a slip of paper showing the amount due to him. Usually he is so anxious to cash his "slip" that he really hasn't time to launch his canoe, but swims out to the trader, quite regardless of sharks. Having cashed his slip, he joins the "mob" and waits his turn to buy from the trade room. Tobacco, kunnikai (print for his "Janie" to go to church in), fishing lines, a pipe (either a twopenny pink clay or a £1 briar), and some paint for his canoe, are the chief purchases made. He then goes out on deck and spreads his possessions out before the admiring faces of those around him. After the tin of paint has been opened for inspection several times, and the new pipe tried by all and sundry, he bundles the goods together and has his own turn at admiring other people's purchases. Somebody perhaps hits upon a pleasing perfume, and a rush is made for that article until it is sold out. *Eau de Cologne* was once the fashionable perfume, but the Government found the natives applying it inwardly and so becoming drunk. It is now prohibited. When the excitement has worn off, the native just slides over the rail, and with one hand holding his treasures above his head, swims back to the shore.

Throughout the group the natives are adepts at model canoe racing and kite flying. The kites are sixteen feet in length and generally shaped like an artist's palette. Regattas are held periodically both for model and large canoe racing, some of the latter carrying tremendous sails and easily attaining a speed of twenty knots.

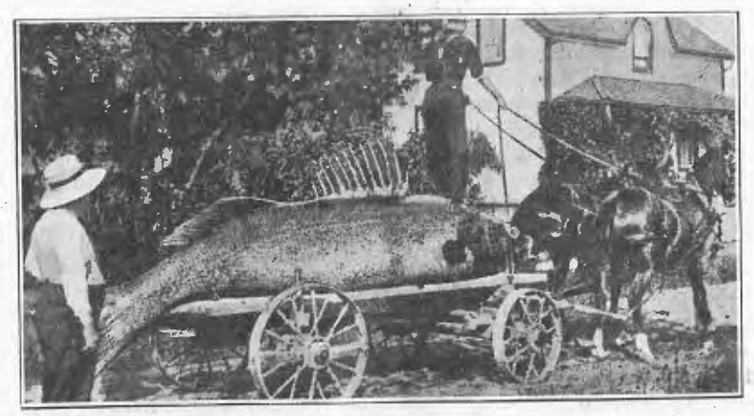
The party of which the writer was a member stayed the best part of a year in the group and wireless telegraphy played a very important part in making the world's general news and also the state of the copra market available to all concerned. Although the vessel was only three hundred tons, distances up to six hundred miles were achieved in daylight. The station was the general one for the colony, and the Government authorities were so pleased with the results that they are considering the question of having a permanent one erected. The natives at first looked upon wireless with awe and were fully certain that the *Tienti* (ghosts) had something to do with the business, but later on decided that it was just "fashion belong white man."

A HINT FOR TOURISTS

The pleasure and benefit derived from a holiday, particularly when one is venturing forth to localities unacquainted with, are vastly increased by having a well-mapped-out itinerary to guide one's movements.

It is true to a very great extent that many pople have only a very indefinite knowledge of the geography of their own State. It is not surprising, therefore, when a visit to a neighbouring State is planned that the average tourist feels rather doubtful as to his, or her, ability to get the most out of the holiday owing to an inadequate knowledge of the districts to be traversed. Here is where the value of an itinerary comes in. Residents of New South Wales, or in fact any part of the Commonwealth, who propose visiting Queensland should avail themselves of the excellent service offered by that State's Tourist Bureau in George Street, Sydney. Countless people have spoken in high terms of the valuable information which the New South Wales Director, Mr. Eaborn, who knows Queensland from one end to the other, has afforded them from time to time.

NOW IT'S YOUR TURN TO TELL ONE!



This is the sort of fish certain disciples of Izak Walton "say" they catch with a hook and line. And they are all honourable men— after the fashion of fishermen!

AUSTRALIA'S GREATEST RAILWAY

KALGOORLIE TO PORT AUGUSTA

By M.D.

THERE are many features about the trans-Australian railway — which spans the continent from Kalgoorlie in Western Australia to Port Augusta in South Australia, a total distance of one thousand and fifty-one miles—which make it of outstanding interest to the people of this country. It can readily be conceived what tremendous difficulties the building of such a line involved. Apart altogether from the cost, which was tremendous, the task of assembling the materials, clearing the line and laying the rails was in itself an undertaking of great magnitude. Sleepers to the number of two million five hundred thousand, cut from the best Australian timber, were used to support the rails, the approximate weight of which amounted to one hundred and forty thousand tons. The gauge of the line is the world's standard, four feet eight and a half inches, and the building of it necessitated the removal of five million cubic yards of earth and rock. The route was across the famous Nullabor Plains, so named because they are treeless, and while traversing this long stretch the line proceeds without a curve for three hundred miles, which is probably the longest straight run in the world. Another notable feature is that from one end to the other the line does not cross a single permanent stream of water.

Means of transport before railway was built.

The Regions Traversed.

The country through which the railway runs is naturally divided into four sections, the first being the granitic plateau which extends eastward from Kalgoorlie a distance of one hundred and sixty-seven miles. The next stretch entered upon is the limestone plain running eastward for four hundred and fifty miles from the edge of the granitic country. Beyond the limestone plain a belt of sandhills extends a distance of fifty miles and then comes the final run of about four hundred miles to the eastern terminus of the line at Port Augusta. When Kalgoorlie is left the line runs across a plateau which has a gradual easterly dip varied here and there by ridges, and broken by outcrops of granite in the form of low, rounded hills. The highest point on the line is met with about one hundred and one miles east of Kalgoorlie, where a shallow cutting has been made through the summit of one of the ridges. The height above sea level at this point is one thousand three hundred and twenty-six feet. Forty-five miles farther on at Goddard's Creek the level falls to nine hundred feet.

The first section of the line runs through timbered country, the trees being mainly salmon gums, while in parts the kurrajong, eucalypts and the odoriferous sandalwood—the true commercial variety—are fairly plentiful. Many hundred tons of the latter have already been shipped to the east, where its fragrance is much appreciated by the inmates of the Chinese joss-houses. For mile after mile the country on each side of the line is covered with everlasting daisies, and in the spring the native hop with its rich, reddish-brown masses of flowers forms a strange contrast to the sombre green of the trees and shrubs.

Aborigines near Ooldea.

About one hundred and sixty-seven miles out from Kalgoorlie the granite dips beneath the limestone and a sudden change becomes apparent in the landscape. The eucalypts vanish as if by magic, and no further trace of them is seen till the Ooldea sandhills, four hundred and fifty miles farther east are reached. Forty miles farther on comes the open plain where the black oak, myall and mulga grow fairly plentifully. As the line approaches the two-hundred-mile point the trees become more scattered, while the bluebush and the saltbush, the characteristic plants of this country, grow more extensively.

The Nullabor Plain is then entered on and for hundreds of miles there is not a tree, and only at rare intervals a bush, not more than three or four feet high, to be seen. The plain is not dead level country, but rolls away, mile after mile, league after league in gentle undulations. A foot or so of red soil covers the limestone, but on all the rises fragments of the broken substance project upwards through the soil or lie loosely upon the surface. At varied intervals there is a greater depth of soil, and here the grass and other vegetation grows luxuriantly. There is something fascinating in travelling over these vast plains. For three hundred miles the line runs without a curve, and one can gaze either ahead or behind along the shining rails till they seem to meet in the distance. There is nothing else visible but plain and sky, not a tree, house or any of the signs of habitation which one instinctively looks for. At night when the plain is sleeping under a cloudless sky the moon and stars shine forth with a brilliancy not seen in moister climates, and in the silver light the bluish-white and green of the bluebush and saltbush give an atmosphere of unreality to the scene. The plains embrace

an area of nearly one hundred thousand square miles, and geologists have told us that it was once covered by an ancient sea. Beneath the limestone surface the earth abounds in caverns and subterranean passages, while a characteristic feature of parts of the plain are "blowholes," which communicate with the passages beneath. The best cave yet discovered is located about two miles from the railway station at Loongana, and has been named Lynch's Cave, after the first Federal Minister to visit it.

At various intervals on the surface of the plain pieces of natural glass are to be found. They are black in colour and resemble the osidium found in some volcanic regions. It is difficult to account for their presence there owing to the fact that there is no volcanic country for hundreds of miles around.

When four hundred and fifty-two miles east of Kalgoorlie the line runs across the border into South Australia. The only indication of a change from one State to another is a small stone cairn on each side of the line. For a further one hundred and fifty miles the plain extends until the six-hundred-mile-point from Kalgoorlie is reached, and then on the north-eastern horizon the outline of the Musgrave Range comes into view. A few miles further on the character of the country changes, trees begin to appear on the landscape and grass and other vegetation assumes a luxuriant growth.

At Ooldea the sandhill belt begins, and from thence on the country is a succession of ridges and hollows which run at right angles to the line. The Ooldea soak, about three miles from the line, has an interest both historical and practical. In the middle of a bare, open area of sand surrounded by steep hills a permanent supply of fresh water is available a few feet below the surface. Elsewhere along this section of the line the water obtained by boring is salt, but at the spot referred to it is perfectly fresh. It was a great boon to surveyors and workmen engaged in building the first stages of the line, and even as far back as 1875 it was availed of by the explorer Giles, who crossed a portion of the great Nullabor Plains.

The surface of the country over the last stretch from the sandhills to Port Augusta becomes more varied than on any other portion of the long line. About two hundred and seventy miles from Port Augusta the first fence which the line crosses since leaving Kalgoorlie is met with. It is on the outer boundary of the Wilgena run, which embraces an area of three thousand square miles. The hilly country is soon left behind and the "Lakes Country" entered upon. The so-called lakes are but vast shallow pans, many of them hundreds of miles in extent. In rainy seasons they hold a shallow depth of water, but in dry times they are merely beds of salt. The line crosses a corner of Lake Hart, and later skirts the shores of the Island Lagoon, in the centre of which stands a remarkable hill, shaped like a miniature volcano. Further on Lake Windabout is also crossed, and beyond it lies Pernatty Lagoon, the waters of which are impregnated with copper. Fifty miles of more or less plain country follows and then the line runs across the extreme head of Spencer Gulf at Yorkey's Crossing, and Port Augusta is reached.

Ladies' portion of first-class lounge car.

The climate on this long run is almost uniformly good. In summer there are occasional hot days, such as are experienced in other parts of Australia, but at night, particularly on the Nullabor Plains, refreshing breezes blow in from the Australian Bight.

Throughout the winter months the air is light and clear, and the sun almost invariably shines from a cloudless sky.

The arrangements for the comfort of train travellers are all that could be desired. Sleeping and dining cars for first and second-class passengers are attached to every through train. Telegraph facilities are available at almost every station and passengers may have telegrams addressed to them *en route*. A brief summary of the more important news of the day is telegraphed along the line and made available in the lounge car. Passengers are thus enabled to keep in touch with the outside world when travelling from one end to the other of Australia's longest railway line.

Interior of dining car.

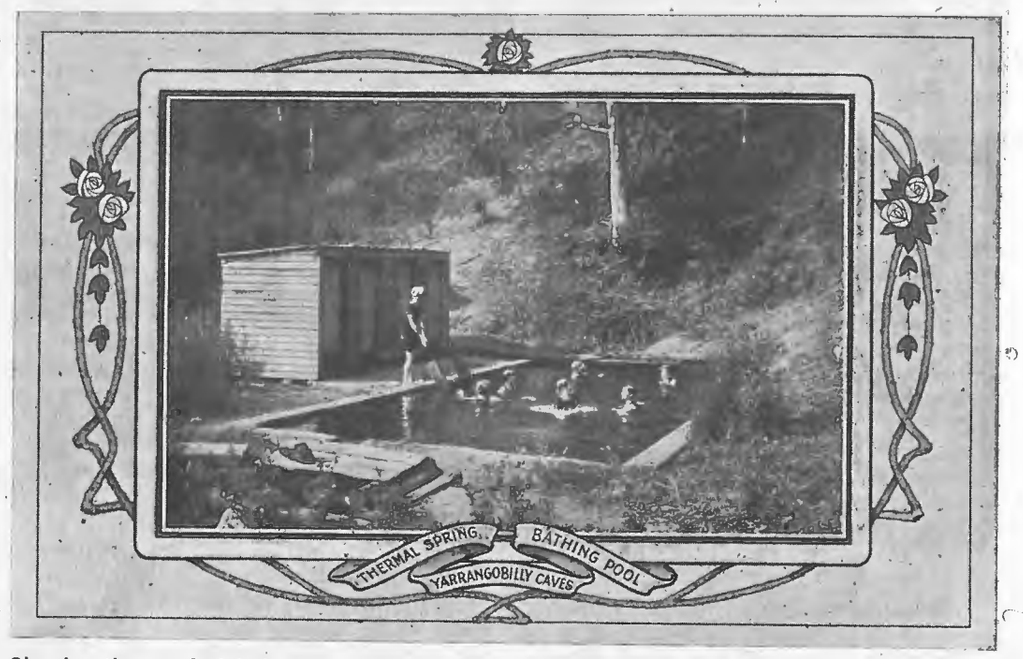
Our Words are Powers.

Our words are living forces. Whatever we speak into life is flung back to us in kind. It is a law. If you speak disease, discordant conditions, inferiority, you are perpetuating these things, you are sowing seeds which will bring back a corresponding harvest. Our words are powers for good or evil.

YARRANGOBILLY CAVES

THE WONDER CAVERNS OF THE SOUTHERN ALPS

These wonderful caverns are situated in the wild Talbingo Ranges, fifty miles away from the nearest rail town of Tumut, three hundred and thirty-two miles from Sydney.



Showing the wonderful thermal bathing pool, the marvellous healing properties of which will one day transform Yarrangobilly into a luxurious spa.

French Sloop in Sydney.

AN interesting arrival in Sydney recently was the French sloop *Aldebaran.* She brought a number of French troops who were on their way to Tahiti to join the garrison there. Wireless experiments which were conducted aboard while the sloop was in the Pacific enabled her to pick up both the Bordeaux and Lyons stations.

* * *

Smart Bunkering.

What is claimed to be a smart bunkering feat took place at Port Kembla recently when the steamer *Australmead* loaded seven hundred and eighty-three tons of coal in four and a half hours. The steamer arrived at the coal berth at 3.30 p.m., completed bunkering at 7.50 p.m. and left for Geelong at 8.30 p.m.

* * *

"Suevic" Re-Conditioned.

The White Star liner *Suevic,* which is due to arrive in Sydney early this month, has recently been reconditioned, and her passenger accommodation is now modelled on the most modern lines. Additional bath-rooms have been installed, and small tables to seat four, six or eight persons have been placed in the saloon. Electric fans have been fitted in most of the cabins and future travellers by this popular liner will have little to complain of regarding lack of comfort.

* * *

Newcastle's First Wharf.

A link with the past is furnished by a reference to the *Sydney Gazette* of March 16, 1827, in which it is recorded that "Mr. Alexander Busby, under the direction of his father, the civil engineer, has succeeded in completing the wharf at Newcastle, which is one hundred and sixty-nine feet long and proportionately wide. At the extremity, even at low tide, there are from six to seven feet of water, besides three or four feet of mud, so that vessels frequenting Newcastle can discharge and take in cargoes with every despatch."

To-day, ninety-four years after the above was first written, Newcastle can boast of many modern wharves and is easily the most important shipping centre in the State outside Sydney.

* * *

Japanese Liner in a Typhoon.

Some months ago the Japanese mail steamer *Aki Maru* encountered a typhoon between Nagasaki and Hong Kong on her voyage to Australia. A sister ship, the *Nikko Maru,* had a similar experience on her last voyage to Australia from the East. When on her way from Kobe to Yokohama a violent storm enveloped the vessel. The wind blew with hurricane force, and huge seas swept the decks. A wooden mast and the wireless aerials were carried away, and conditions became so bad that Captain Takano decided to stop the engines. For ten hours the storm raged, but in spite of its ferocity the vessel behaved splendidly, and beyond the unpleasantness associated with such conditions there was no alarm amongst the passengers.

* * *

Death of Captain J. L. Fawkes, R.N.R.

A well-known shipping identity, Captain J. L. Fawkes, R.N.R., passed away in Sydney recently. Captain Fawkes had been associated with the mercantile marine, and particularly the Torres Straits pilot service, for over half a century. Prior to coming to Australia he was in the Royal

Navy and saw active service in China. After leaving the Navy he joined the Black Ball line of steamers then trading between London and Queensland ports.

Amongst the many thrilling incidents in which Captain Fawkes figured was the foundering of the steamer *Catterthun,* off Seal Rocks, when on a voyage to Thursday Island. He was a passenger at the time, and was one of the three sole European survivors.

The deceased mariner was a cousin of Admiral Fawkes, who was at one time Naval Commander-in-Chief of the Australian Station.

* * *

Cruise of H.M.A.S. "Brisbane."

The two months' cruise of H.M.A.S. *Brisbane* along the Queensland coast and amongst the Pacific Islands was marked by very little in the way of incident outside the tropical heat, which at times was very trying. After leaving Sydney the cruiser called at Hervey Bay, where exercise and training were carried out. Gladstone was next touched at, and then the island cruise commenced. The ship's company enjoyed the cruise immensely, and they report that conditions in the islands are prosperous. The settlers appeared happy and prosperous, and despite the fall in the price of copra a most optimistic spirit prevailed. A number of those on board the *Brisbane* had not previously visited Rabaul, and they were agreeably surprised at the lay-out of the town and the splendid class of buildings and excellent roads.

* * *

"Ceramic's" Fast Voyage.

The White Star liner *Ceramic* made a fast passage between Liverpool and Melbourne on her last outward voyage; the time occupied being only a few hours over twenty-nine days. During the trip wireless messages were received from the *Boonah* and the *Otira* warning the master of the presence of icebergs. The *Ceramic's* course was diverted slightly in consequence—a fact which still further enhances her fast passage. One of the crew disappeared while the vessel was in the tropics, and it is presumed that he fell overboard. Another fatality, that of a passenger who died in his bunk from heart failure, also occurred during the voyage.

Vessel Encounters Icebergs.

The voyage of the Swedish training ship *G. D. Kennedy* from Gothenburg to Australia was of rather an eventful nature. Soon after leaving the Cape the vessel ran into a strong westerly gale and high seas which lashed her unmercifully. During the height of the gale a heavy sea broke on board and carried away a cadet, the youngest member of the crew, who was on his first voyage. The vessel was hove to and a bright look-out kept for the unfortunate lad, but he was not again sighted.

Many icebergs were seen when the vessel was in southern waters, some being observed as far north as forty degrees fifty minutes. Special care had to be taken in navigating in these waters owing to the great risk involved, but thanks to Captain Bergendahl's watchful care the ship came through safely.

* * *

World's Largest Liner.

The quadruple-screw steamship *Majestic,* of the White Star Line, is nearing completion and is expected to take her place in the Southampton-New York mail and passenger service in the near future.

With a length over-all of nine hundred and fifty-six feet, a height from keel to boat-deck of one hundred and two feet, and a beam of over one hundred feet, the *Majestic* will have a gross tonnage of fifty-six thousand, and will be the largest vessel in the world. She will be fitted with turbine engines of one hundred thousand horse-power, developing a speed of twenty-three knots. The vessel will burn oil fuel. Five steel decks will run from end to end of the ship, and above them will be steel-plated erection decks running at least half the entire length of the vessel. Special care has been taken to ensure the stability of the vessel, and to guard against fire.

The steamer will carry three wireless stations, the most powerful of which will be capable of maintaining communication with both continents during the whole voyage. The life-saving equipment includes two motor boats fitted with wireless, and elaborate submarine signalling gear has been installed on the liner to ensure safe navigation in a fog.

Three classes of passengers will be carried; the total number for which accommodation is provided being about four thousand. There will be three large halls on the promenade deck—"The Lounge," "The Palm Court," and "The Restaurant." The total area of the dining saloon will be eleven thousand three hundred and fifty square feet. The swimming bath, which is situated forward of the dining saloon has an area of eight hundred and twenty square feet, and a depth of nine feet, except in one portion, where the floor has been raised to provide a shallower depth for those unable to swim. The bath can be supplied with one hundred and twenty tons of warm sea water in a little less than half an hour. Thirty dressing rooms are provided for bathers and in addition there are special steam and electric baths. Surely the expression of "travelling in luxury" might well be applied to those who are so fortunate as to voyage across the Atlantic in this floating palace.

* * *

Cost of Oil Fuel.

Some interesting facts relating to the huge expense involved in running an oil burning vessel were supplied recently by Captain R. C. O'Brien, master of the U.S. & A. liner *Easterner.* On his previous voyage to Australia in command of the *Nishmaha,* Captain O'Brien explained that his company had to pay £15 a ton for oil fuel whereas coal is now only costing thirty shillings a ton. An oil burning vessel consumes about thirty tons a day, and heavy losses have been sustained on several voyages of American oil burners to Australia.

* * *

A Cargo Greyhound.

The new freight liner *Middlesex,* the latest addition to the Federal Steam Navigation Company's fleet of merchantmen arrived in Sydney recently in command of Captain White-Parsons after a wonderful passage, *viâ* the Cape. The time occupied was only thirty-seven days, and had it not been that heavy gales were encountered and the master decided that rather than overstrain the engines he would reduce speed, the time would have been much less.

The *Middlesex* is of twelve thousand tons deadweight, and was built at Walker's, on the Tyne, by Messrs. Swan, Hunter and Wigham Richardson. Her propelling machinery consists of two steam turbines turning a single screw. The vessel is registered 100 A1 at Lloyd's, and her up-to-date freezing machinery, large insulated holds for the carriage of perishable cargo, and wonderful array of derricks to ensure quick loading and unloading represent the last word in up-to-dateness in a freight liner. A cruiser stern and provision for either coal or oil fuel, together with the latest steering and other safety devices, which the war taught shipbuilders as being necessary, are other distinguishing features. The vessel is four hundred and eighty feet long, sixty-two feet eight inches wide, and thirty-five feet two inches deep, and as already indicated, has a rare turn of speed. She will be regularly employed in the monthly express service run by the F.N.S. Co., for whom Messrs. Birt & Co., Ltd., are the Sydney agents.

* * *

Long Sea Experience.

Captain A. H. Summers, who recently made his first visit to Melbourne as master of the White Star liner *Ceramic*—the largest single-funnelled steamer afloat—has had an adventurous career at sea, extending over thirty-six years. During portion of the war period he was master of the White Star liner *Suevic,* which carried many thousands of troops between Australia and the Old Country. He was subsequently transferred to the *Georgic,* of the same line, which was afterwards torpedoed in the Atlantic whilst transporting twelve hundred horses and a large quantity of munitions from America to France. The captain and crew were transferred to the captured British tramp *Yarradale* and taken to Germany, where they remained in an internment camp for fifteen months. On arriving at Hull some months after the signing of the Armistice, Captain Summers was appointed to command the Dominion White Star liner *Rimouski,* in the Canadian trade. Later he transferred to the *Ceramic,* then on the Mediterranean run, but subsequently he assumed command of the *Ionic* for a time, afterwards going back to his present command—the *Ceramic.*

* * *

New Passenger Service to New York.

It is reported that the United States and Australian Steamship Company intends to inaugurate a passenger service between New York and Australian ports early in the New Year. The Company is negotiating for the purchase of three eighteen thousand ton steamers of the most modern type, in which all the luxury and comfort

of the most up-to-date hotels will be provided. In addition refrigerated space will be provided for the carriage of cargo.

* * *

Improvements in Ocean-Going Vessels.

As might be expected, improvements are constantly being devised for the comfort and safety of those "who go down to the sea in ships."

Of the former, perhaps the most fascinating, and to the majority of travellers, certainly the most popular, is the gyroscopic machine, or ship stabiliser, which enables a vessel, even in the roughest sea, to maintain a position within two degrees of the vertical. Sea-sickness is a thing of the past on vessels fitted with the stabiliser.

Then there is the gyro compass, which obviates all the defects and errors peculiar to the magnetic compass, and reduces the cost of running by enabling a perfectly straight course to be steered. The direction finding apparatus, and electric steering gear, the latter so arranged that the shock of waves hitting the rudder is rendered impotent, are two more safety appliances that have aroused the keenest interest.

The old-fashioned log that trailed behind the vessel is now out-of-date, its place having been taken by the new electric appliance which projects below the ship's bottom. It is protected from injury by an ingenious device and it indicates on the bridge the speed and distance travelled. Improved boat-launching gear, fireproof appliances and water-tight compartments to lessen the possibility of sinking are other features which will be incorporated in the building of all modern liners.

* * *

Big Motor Ship.

The first of the two motor ships, built to the order of the Union Steamship Company, was launched in England some time ago. She is named the *Mauraki,* and is four hundred and fifty feet long, with a beam of fifty-eight feet, and a cargo capacity of ten thousand six hundred tons. She will be driven by two sets of eight-cylinder *Diesel* engines, developing a total horse-power of four thousand six hundred and sixty, with a speed of twelve and a half knots. The engine-room is situated amidships, and there are six holds, three forward and three aft, served by electric winches, for the carriage of cargo. It is rather a coincidence that the *Mauraki* is the forty-first vessel to be built by the Clyde firm of Denny's Limited for the Union Company.

* * *

Warning to Marine Engineers.

The Marine Board, of Melbourne, has been advised by the Department of Navigation, at Sydney, that several marine engineers have recently been deprived of their certificates by fraudulent means. The police have discovered that advertisements appearing in the press over the names of prominent firms inviting engineers to apply for positions and submit their references, were bogus. Several engineers forwarded their Board of Trade certificates, which were never returned, and when the firms, whose names appeared to the advertisements, were interviewed they disclaimed all knowledge of the matter. The Marine Board therefore enjoins engineers not to be too ready to part with their certificates.

* * *

Steamer Stranded at Greymouth.

The Melbourne Steamship Company's steamer *Perth,* bound for Australia with nine hundred thousand feet of timber aboard, recently became stranded on North Tip Head, Greymouth (New Zealand). She was badly damaged ,and it is feared that she will become a total wreck.

The vessel was drawing nineteen feet of water when she left Wellington, and she bumped just outside Tip Head and grounded immediately. Her lifeboats were at once launched and in less than two hours the crew were safely ashore. The first boat had a perilous run through the surf, but fortunately she managed to weather the severe buffeting, and the members of the crew were well looked after in Greymouth. The spot where the *Perth* went ashore has been the scene of a number of previous wrecks, and is a dangerous locality.

* * *

New P. & O. Branch Liner.

The new P. & O. Branch liner *Baradine* arrived in Sydney on November 14 on her maiden voyage to Australia. She is the first of five vessels which the Company is building for the Australian service.

The *Baradine* is of thirteen thousand one hundred and forty-four tons, and is equipped with the latest refrigerating machinery. She has accommodation for one thousand

two hundred and fifty passengers, and is fitted with a number of single- and three-berth cabins.

* * *

Trial Trip of "Moreton Bay."

The trial trip of the new Commonwealth steamer *Moreton Bay,* which took place in London about the middle of November, was highly satisfactory. The vessel left Liverpool in water ballast and steamed the measured mile at the rate of sixteen and a half knots without fully extending her engines. Later the steamer made a special twelve-hour run, on which she exceeded all expectations. It is confidently expected that an average speed of fifteen knots will be maintained on the run to Australia on a consumption of eighty tons of oil daily, which is considered most economical.

The accommodation for passengers, officers and crew exceeds the requirements of the Commonwealth Navigation Act. Experts have described the immigrants' quarters as the roomiest, healthiest and most comfortable yet provided in the history of European emigration.

* * *

Busy Port of Sydney.

A reminder of the activity of pre-war days in Sydney Harbour was furnished on November 14, when ships totalling over one hundred and twenty thousand tons entered the Heads. In the early morning the vessels commenced to arrive, and the port officials had an exceptionally busy time during the day in handling the big fleet. The arrivals included the new P. & O. Branch liner *Baradine,* the *Mantua, Anchises,* and the H.M.A.S. *Australia.*

* * *

Stranded "Wollongbar."

It is reported that workmen are now engaged in removing the engines from the stranded steamer *Wollongbar,* which was blown ashore at Byron Bay in a heavy gale some months ago. The vessel was subsequently offered for sale by public auction in Sydney and realised only £1,600. It was freely reported that the purchasers intended making further efforts to refloat the steamer, but apparently the project has now been abandoned.

The *Wollongbar* was only a comparatively new steamer, and in her day enjoyed the distinction of being the fastest passenger vessel on the coast. She was intensely popular with travellers, and her great cargo carrying capacity was a boom to the rich agricultural and dairying districts surrounding Byron Bay. Her place has been taken by the *Pulganbar,* which, because of her speed and roominess, was withdrawn from the Clarence River service to take the *Wollongbar's* place on the Byron Bay run.

It is now reported that plans and specifications have been sent to England for a new steamer to replace the *Wollongbar.* The new vessel will be a little larger than the *Orara,* and will have extensive and up-to-date passenger accommodation. She will be a single-screw steamer possessing a fine turn of speed.

* * *

A Flourishing Line.

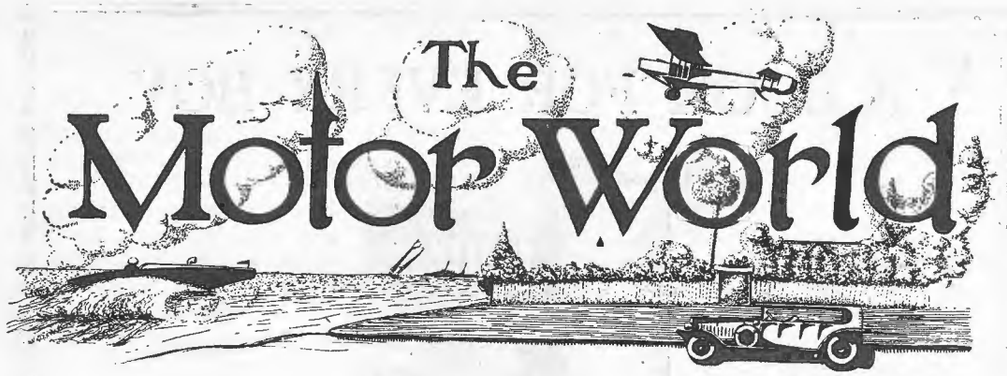
In spite of the general depression in the shipping world the Canadian Government Line is forging rapidly ahead. The Sydney agent, Mr. D. O. Ramsay, has been advised that no less than seven steamers are now loading in Canada or are already on their way to Australia. Of this number six are newcomers to Australia and several are on their maiden voyage.

The principal cargoes which the steamers are bringing to this country are timber and oil, enormous quantities of both being listed to arrive here during the next few months. The management of the Line is also gratified at the large quantities of wool, hides and general cargo which the steamers have lifted on their recent homeward voyages.

* * *

A Long Non-Stop Voyage.

The new steamer *Era,* built to the order of the Australian Steamships Ltd., recently arrived in Melbourne, having voyaged from Glasgow by way of South Africa—a distance of 12,262 miles. This is one of the longest non-stop voyages made to Australia in recent years, and occupied fifty-two days, the average speed being 9.62 knots an hour. The *Era* came out in ballast under the command of Captain D. A. Henderson, who before the war was an officer on a steamer trading to Australia. Practically the whole of the crew were engaged in Glasgow, but they were paid off at Melbourne, and Australian seamen will man the vessel when she takes up running in the interstate cargo trade.



By "SPARKING PLUG"

Fords Sold out.

THE Sales Manager (Mr. Steele) of Davies & Davies, Limited, *Ford* distributors for New South Wales, has hoisted the "sold out" signal until January—such is the demand for *Ford* cars.

In explaining the shortage of *Fords,* Mr. Steele stated that many prospective car purchasers to-day paid more attention to economical maintenance than satisfying the dictates of fashion, hence the demand for a cheap car which can be relied upon to deliver the goods at a minimum of expense to the owner. The demand was not restricted to Australia, as the American market had been exhausted by oversea countries, which probably would mean that a period of six months would elapse before the Australian market could be replenished.

"In order to more effectively safeguard the interests of our customers," continued Mr. Steele, "we commenced operating our *Ford* repair shop on the contract repair plan instead of hourly basis, as formerly used. In adopting this plan we followed the lead of the *Ford* Motor Company of Canada, who for some time past have insisted that this method be followed in all of the larger *Ford* service stations in Canada. Experience has shown that the contract plan is much more satisfactory, as every owner can ascertain exactly what the repair charges will amount to for any operation or combination of operations required on his car. In the hourly method the customer is charged the same rate per hour whether the work is done by a fast worker or a slow worker, a good mechanic or a poor mechanic. Also, under the old method the garage man made more out of the slow mechanic than he did out of a fast mechanic, as the slow worker took more hours for the same amount of repairs. This was not as it should be. Under the contract basis, if the man is slow the garage is the loser, and not the customer.

"In order to successfully carry out this schedule one of our principals visited the *Ford* Motor Company, Detroit and Canada, studied their service equipment station and methods, selected the most suitable and complete plant, which has now been installed in our service works and ready to give complete service at such prices as have never been approached in Australia.

"The low prices are possible only by the installation of special plant which is manufactured for *Ford* service alone. It is not suitable for any other make of car, hence our business is *Fords* and *Fords* only."

* * *

Silent Cops.

A writer, who acknowledges that he is not the owner of a motor car, sarcastically slates the motoring community in an article published in one of the Sydney papers recently, in which he endeavoured to depict the motoring fraternity generally as a semi-murderous gang ready to annihilate all and sundry as fast as they cross the motorist's pathway.

He puts it down as a popular delusion that the streets belong to the pedestrian, and regards it as somewhat cowardly to run over a defenceless silent cop whilst dodging the live ones who can retaliate.

By way of being practical the writer recommended that the silent "bobby" might be all the better if made with six-inch spikes on him, just with the idea of making an impression or puncturing a few tyres and providing some innocent merriment for any likely spectators in the vicinity. Or they might discharge black paint over the occupants of the car, so that a human cop could identify them farther along the road. Failing these deterrents, the writer of the article abovementioned thinks a few plugs of gelignite might arrest the progress of driver and car, and if the pace of the latter was too slick for the explosion, then a wire rope stretched across the street at a convenient height, say in line with the driver's throat, would arrest the latter's progress, even if the driverless car were compelled to continue the journey minus the guiding influence of the man at the steering wheel.

But this is not the limit of the writer's anti-motoring crusade. As a last hope he would engage an army of Chinese market-gardeners to parade on dark nights up and down suburban thoroughfares with heavy market carts and carrying no lights. The only fly in the ointment, he forsees, is that the supply of Chinamen would rather quickly run out, but he soon disposes of that objection by suggesting the substitution of politicians, actors and artists for the exhausted supply of self-sacrificing Chinamen offered up as holocausts on the altar of public safety.

No doubt if *he* were Premier for a day he might import a few tanks and gatling guns with which to make a complete job of the business, but in that case he would

The International Speed Truck, which has just completed a very successful run from Melbourne to Brisbane, a distance of one thousand three hundred miles.

The photograph shows the Lord Mayor of Sydney, Alderman W. H. Lambert, welcoming Messrs. J. C. Hoyt, P. J. Rodney and J. McCartney, who were demonstrating the truck, on their arrival at the Sydney Town Hall.

have a Government car at his disposal and no doubt he then would rather turn the tanks on to less fortunate pedestrians if they refused to jump clear of his car at the first toot of his sounding horn.

* * *

Ran Over Himself.

The driver of a *Hudson Super-Six*, when making his way down Market Street recently, called a newsboy and asked him to run across the street to the tobacconist shop and buy him a packet of cigarettes. The newsboy refused and promptly advised the driver to run over himself.

He did.

* * *

WHERE TO GO AT CHRISTMAS.

With the advent of Christmas and New Year holidays the dull cares of everyday business life may be temporarily discarded whilst an effort is made by motorists to exploit the country for its mental tonic of refreshment and exhilaration.

Quite a number of short trips to the country may be undertaken for one, two or three days at a stretch, according to the disposition of the motorist. Some, perhaps, may prefer, like Dr. Gordon Craig, of Macquarie Street, to pack up sufficient to keep body and soul together for a week or more and go on a motoring gallivant into country districts little visited by ordinary folk.

* * *

Glimpse at Narooma.

For those desiring to "rough" it amongst the strong-scented wildflowers, and with only the irrepressible bunny to cross the landscape, a run through the country round about Moruya, Narooma, to Cobargo, combines all that is needed by a city business man in search of a delightful holiday.

The South Coast route can be followed *viâ* the famous Bulli Pass, taking in a variety of scenes on land and water until Nowra is reached. In making a detour for Moruya and Narooma, some of the loveliest and most enchanting scenery will be encountered. Peaceful Narooma will be indelibly stamped on the imagination as the coming holiday resort for Sydney's work-worn tourists. Unsullied by the march of civilisation, such as the Blue Mountains with their ever-increasing populations and new business centres, Narooma and its surrounding majestic forests and silvern lakes will long linger as a sweet memory when other scenes have been relegated to the limbo of a forgotten past. The writer will always vividly recall the last glimpse of Narooma's peaceful lake just off Corunna Beach in a motor run through to Tilba Tilba and Cobargo. It was towards evening as the car wound its way through the luxuriantly foliaged pathway in the vicinity of the Dandelion Mountains. The lake was studded midst a thick forest of trees, whose shade with the approaching darkness served to further enhance the exquisite beauty of the silvery waters. As we sped along to Cobargo the wonderful perfume of the wild flowers and the cool, bracing atmosphere as we climbed the mountain with its rugged and enchanting scenery, uninterrupted by the hand of man for over forty miles, was a trip to be experienced to be properly appreciated. Cobargo is a real country town, where Sydney visitors who are anxious to be plunged into the heart of the bush will be more than satisfied. From this point the road may be taken to Bega or Eden, the garden of the Mother State. The roads on the whole are good. For a tip-top week's "roughing it" motoring parties will find it hard to surpass an exploration among the charming scenery of the southern districts.

* * *

Kuring-gai Chase.

For parties desirous of breaking up the holidays into one-day or half-day trips, a number of runs suggest themselves, but it would be extremely difficult to cram more pleasant scenery into the half-day than the trip to Kuring-gai Chase and the Hawkesbury River. Cars proceed *viâ* the North Sydney horse-punt at Fort Macquarie to Milson's Point, thence following the tram line to St. Leonards railway station, where the railway is hugged until Turramurra is reached: where a turn to the right brings you into Kuring-gai Chase.

Proceeding through the Chase, the Hawkesbury River is reached at Bobbin Head, where, after descending, the return journey is commenced through Foley's Bay Causeway and Colah Road to Hornsby. A diversion is made here from the North Shore line, and cars proceed next to Pennant Hills, viewing the Commonwealth high-power wireless station, and then across through the beautiful orange groves in the Carlingford-Parramatta district to Parramatta town. At Parramatta there are many

features of historic interest to be seen—the old Government House, Parramatta Park, the historic memorials, and the King's School. The return to Sydney is made *viâ* new Parramatta Road, reaching the city at 5.45 p.m. This trip is without doubt one of the finest half-day's trips outside of Sydney, and one that everybody should make.

* * *

Bulli Pass.

A day brimful of enchanting scenery awaits those taking the trip to Bulli Pass, which is becoming increasingly popular as a result of the Tourist Bureau's advocacy of the run. Cars proceed to Newtown, thence through St. Peters, Tempe and Rockdale to Tom Ugly's Point, here cross George's River on punt, and follow main South Coast Road *viâ* Sutherland, Loftus, Heathcote and Waterfall (see Waterfall Sanatorium) to Bulli Pass.

From the Bulli Pass Look-out and Sublime Point, the traveller gazes on the most magnificent panoramas of ocean, mountain and forests imaginable. Townships and coastline are discernible for thirty miles south.

Cars will run down the Pass to Thirroul, where an excellent lunch may be obtained.

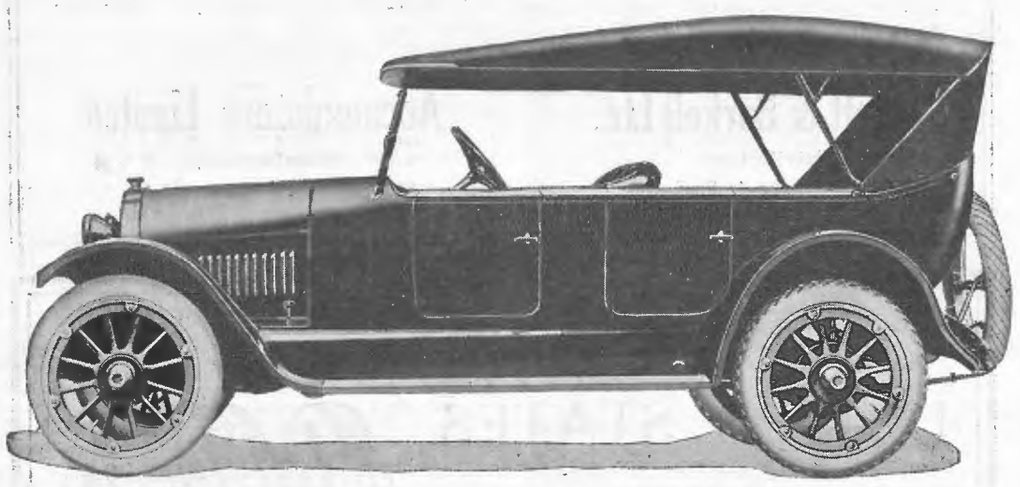
On the return journey, tourists will be taken *viâ* the Coast Lower Road, through Clifton, Scarborough and Stanwell Park, thence to the top of Bald Hill, another splendid look-out. The main road will again be picked up in two miles, and the next diversion will be at Waterfall into the Lady Carrington Drive. This drive of ten miles to National Park is almost beyond description in its wealth of ferns, palms and native flowers, and out-rivals any thing of its kind in Australia. Afternoon tea may be obtained at National Park.

The return journey can be made *viâ* Tom Ugly's Point arriving in the city about 5.30 p.m.

* * *

Motor Cycling.

H. A. Hodgson's Melbourne-Sydney record is the feature of this month's motor cycling. He completed the distance (five hundred and sixty-six miles) in eighteen hours eleven minutes, averaging thirty-one and a third miles per hour for the journey.



The new "Oldsmobile-Four," just landed by Boyd Edkins Ltd., Sydney, who are the sole distributors for New South Wales.

Hodgson's time is two hours twenty-seven minutes better than that put up by Fred Berry, who, however, preferred the safer method of a side-car for record-breaking purposes. Hodgson, who rode a *Harley-Davidson*, fitted with *Dunlop* tyres, clipped five and a half hours off the previous best solo record, which was held by Jim Bolger.

Hodgson encountered a number of remediable delays *en route* which he calculates made a difference of a couple of hours to his time. He is quite confident of completing the journey in sixteen and a half hours, provided he can secure an uninterrupted run from the southern city to Sydney.

The new record-holder is a flyer in more ways than one. He also affects aerial adventure and during the war was a distinguished member of the Australian Flying Corps in France.

A glance at Hodgson's schedule times for the distance and his actual times from point to point should prove interesting to motorists contemplating a similar journey:

	Schedule Time.	Time of Arrival.
Melbourne	2.00 a.m.	—
Seymour (61 miles) ..	4.00 a.m.	3.40 a.m.
Benalla (123 miles) ..	6.00 a.m.	6.50 a.m.
Albury (193 miles) ..	8.00 a.m.	8.16 a.m.
Holbrook (229¾ miles)	9.00 a.m.	9.22 a.m.
Gundagai (312 miles) ..	12.00 noon	12.05 p.m.
Yass (377½ miles) ..	2.00 p.m.	2.05 p.m.
Goulburn (432 miles)..	4.00 p.m.	3.55 p.m.
Sydney (566 miles) ..	8.30 p.m.	8.11 p.m.

* * *

Boyd Edkins pulled off the double with his *Vauxhall* in the Royal Automobile Club of Australia's hill climb at National Park on Saturday, November 5. Eighteen cars competed in the formula event, the 20-16 horse-power *Vauxhall* acquitting itself with distinction by winning with twenty-two points to spare. With a 30-98 *Vauxhall* in the speed tests Edkins negotiated a stiff hill of three-quarters of a mile in the fine time of sixty-nine and three-fifths seconds. In the handicap event A. V. Turner's 76 horse-power *Itala* established one minute seven seconds for the hill, which is a new record for the distance. The excellence of the performance is further enhanced by the fact that a tyre burst while the car was skidding, thus compelling the driver to complete the last furlong on the rim.

Details of the first six places in the speed test, formula event, and handicap are as follow:

Speed Test.

Boyd Edkins (30-98 *Vauxhall*), time 1 min. 9⅝ sec. 1
A. V. Turner (*Itala*), 1 min. 10⅝ sec. 2
S. C. Ottoway (*Vauxhall*), 1 min. 13⅝ sec. .. 3
Wm. Stuart (*Essex*), 1 min. 19⅝ sec. 4
H. M. Hart (*Essex*), 1 min. 22 sec. 5
R. H. Roberts (*Bianchi*), 2 min. 5 sec. 6

Formula Event.

Boyd Edkins (*Vauxhall*), 20-16 h.p., 82 sec. 4,396 lbs., 266 points 1
Wm. Stuart (*Essex*), 18-98 h.p., 88⅝ sec., 4,088 lbs., 244 points 2
S. C. Ottoway (*Vauxhall*), 26-25 h.p., 80⅕ sec., 4,466 lbs., 225 points 3
H. M. Hart (*Essex*), 18-98 h.p., 99⅝ sec., 4.083 lbs., 215 points 4

A. G. Barnard (*F.I.A.T.*), 9-45 h.p., 145¾ sec., 2,912 lbs., 211 points 5
Boyd Edkins (*Vauxhall*), 29-15 h.p., 72⅘ sec., 4,088 lbs., 210 points 6
Eighteen started.

Handicap Event.

A. G. Barnard (*F.I.A.T.*), 2,688 lbs., 94 sec. handicap, time 141⅘ sec., result 47⅘ sec. 1
A. McNeil (*F.I.A.T.*), 2,576 lbs., 91—14—49.. 2
S. C. Ottoway (*Vauxhall*), 4,200 lbs., 25—77⅛—51⅘ 3
W. J. Stuart (*Chalmers*), 3,650 lbs., 39—90⅘—51¾ 4
H. M. Hart (*Essex*), 3,800 lbs., 31—88⅘—57⅘ 5
Wm. Stuart (*Essex*), 3,350 lbs., 25—83⅘—58⅘ 6
Boyd Edkins (*Vauxhall*), 4,350 lbs., 22—82⅘—60⅘ 7
Seventeen started.

* * *

Motorgrams.

The one thousand miles alpine trial organised by the Royal Automobile Club of Victoria attracted thirty-five nominations. The R.A.C.V. selected one of the most strenuous routes yet encountered by those who are partial to reliability contests, the greater portion of the route being mountainous country with an elevation of five thousand feet above sea level. Many "pinches" confronted the contestants, some of the climbs being upwards of thirteen miles, with similar descents down narrow mountain pathways. Prizes to the value of £250 were set aside for the winners of the alpine test, the results of which were not available when this month's issue of *Sea, Land and Air* went to press.

* * *

The importance of the motor as a substitute for, and also as a successor of, railways is surely, if only gradually, being impressed on the various State Governments.

The New South Wales Government installed a motor service between Lismore and Grafton whilst Mr. Ball was Minister for Railways and the success of the experiment induced the Victorian Railway Commissioners to despatch a couple of emissaries to the North Coast district to report on the working of it. Their report is to hand and, as a result, the Victorian Commissioners have decided to replace non-paying existing lines with motor trains.

An effort is now being made to induce the New South Wales Railway Commissioners to extend the motor service to the Riverina district, but, on account of limited funds, the famous wheat belt must wait until the Commissioners have carried out a project to establish a motor service between Tamworth and Barraba.

Residents of Riverina are eager to be provided with the motor service, not merely because of economy and more efficient service, but because the steam engine has been responsible for many a bush-fire in the past as a result of stray sparks not discriminating between flammable and inflammable resting places.

* * *

The Queensland Government has decided to construct sound roadways into farming districts not already served by railways. These no doubt will be readily availed of by the motoring houses to link up farm and city with motor lorries. If the farmer in the near future can take his produce to market on these up-to-date lines and still show as big a profit as his brother farmer using railway lines; the career of George Stephenson's steam engine will receive a further blow to hasten it on its tottering path to oblivion.

* * *

Mr. Boyd Edkins, in his twenty horse-power *Vauxhall* (1914), won the formula event at the Royal Automobile Club's hill-climb at National Park on November 5. Cars were obliged to be in complete touring condition and had to carry a full load of passengers. The contest was held on Artillery Hill, which is about six and a half furlongs long. The weight of Mr. Edkins' car totalled four thousand three hundred and ninety-six pounds, and his time for the distance was eighty-two seconds. He also won an impromptu speed test with a thirty-ninety horse-power *Vauxhall* with which he clipped one minute ten seconds off the previous record for the hill established in 1920 by Mr. R. M. Gowing, also with a *Vauxhall*.

* * *

Mr. William Stuart, in an *Essex*, won this year's Dunlop £25 trophy for securing the aggregate number of wins in the Royal Automobile Club of Australia competitions. He won last year's trophy with a *Buick*. Mr. Stuart is an enthusiastic motorist and invariably has a shot at whatever is put on the tapis by the Royal Automobile Club. He won the last trial to Bulli and incidentally secured honours for petrol consumption and the hill-climb. He similarly swept the boards in the reliability trial to Bathurst and back, scoring three hundred and ninety-five out of four hundred points. He was beaten by one point only in the Sydney-Brisbane reliability trial, but he won the prize for the petrol test. At the National Park hill-climbing test early in November he was second in the formula event and acquitted himself with distinction in the speed test, being first among cars under twenty horse-power.

* * *

A reduction of one shilling per case in the price of petrol was announced in Sydney last month. The Vacuum Oil Company has made the reduction in Plume motor spirit, Mercury benzine, Plume benzoline, and Plume aviation spirit. The Texas Company, Australasia, Limited, has made the shilling reduction in the price of Texaco benzine and Texaco motor spirit.

* * *

Motor Yachts' Contests.

Despite unfavourable weather conditions the Motor Yacht Club of New South Wales held two events over the Rose Bay course on Saturday, November 12. The Class B event for boats twelve miles an hour and under, went to *Baby Liberty*. *Baby Revonah* was first to cross the line, but through exceeding her stipulated speed was disqualified.

In the Class A event for boats twelve miles per hour, over Rose Bay-Pilelight course—a distance of nine and a half miles—*Kimba II.*, owned by Mr. K. H. Stanton, nearly came to a disastrous ending. It ran ashore at Shark Island and quickly filled. It was badly damaged and subsequently was towed home. The three placed boats were all disqualified for having exceeded their stipulated speed. Results:

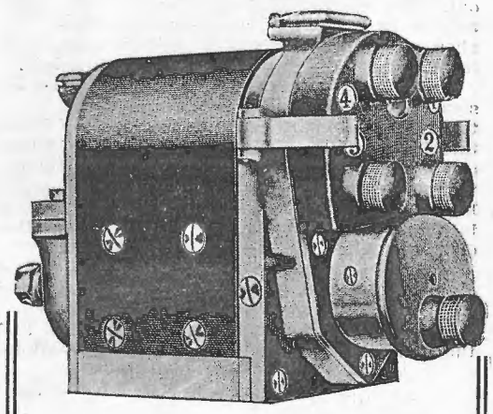
Class B (12 Miles per Hour and Under 4 Miles).

Baby Liberty (J. Spencer Nolan), 21 min. 49 sec.; handicap running time 29 min. 50 sec. 1
Don (C. A. Copeland), 10 min. 11 sec., 33.12 2
Fortuna (J. Weymouth), 6 min. 25 sec., 29.15 3
Baby Revonah (A. Albert), 19 min. 21 sec., 40.48, was first to cross the line, but was disqualified for exceeding the stipulated speed.

Class A (for Boats over 12 Miles per Hour).

Furious (A. E. Keegan), 9 min. 47 sec. .. 1
Henry (R. H. Joyce), 18 min. 36 sec. 2
Neranghi (E. F. Wilks), 8 min. 3

The three boats were disqualified, and the event declared no race.



A PROGRESSIVE MOTOR FIRM

There is probably no better known name in Australian motordom to-day than that of Boyd Edkins Ltd., partly on account of the personal qualities of the man whose name the firm bears, and partly on account of the excellent agencies held, and the efficient and faithful service rendered: and the fact that the firm is handling any particular car is generally accepted as a guarantee that this car will do all that is claimed for it.

No other firm in Australasia handles a more gilt-edged line of agencies. Their cars are the "gems of their class" produced in two continents: England supplies the *Vauxhall* and *Humber;* France the *Renault,* and America the *Mercer* and the new *Oldsmobile*-4.

Motor transportation is excellently catered for by the *Oldsmobile* Economy Truck, and the *Renault* Trucks. The firm gives a three-years' guarantee with every car and truck.

The *Vauxhall* has demonstrated its reliability, durability, and high duty effectiveness in every part of the globe. Everywhere, the car has won out. The engine is a masterpiece. Its ability to run at very high speeds makes the car a phenomenal hill climber. It is especially noted for its silent running and absence of periods.

The *Humber* has for twenty-three years shown steady improvement in material and design, until to-day the 15.9 h.p. model represents the high-tide mark of the moderate priced car. It is a car which is suitable both for town or country work—of perfect workmanship and made of high-grade materials. The same meticulous care in detail is observable in every part of this delightful little car.

The new *Oldsmobile* four-cylinder was placed on the market in America early this year, and its success has been phenominal. "Oldsmobile" has always been a name to conjure with, and the new model, which will make its appearance on the Australian market next month, will undoubtedly extend the fame of the good name already held by the makers of Oldsmobile Products.

The *Mercer* is a four-cylinder car, possessing all the characteristics which go to make it a high-quality and efficient car, and the leading car of its type. Speed and power lose their charm if they cannot be enjoyed safely, economically and comfortably. It is in these lines that the *Mercer* excels.

The 13.9 h.p. *Renault* is too well-known on this market to need elaborate comment in this article. Mechanically it is perfection itself. The *Renault* works are world-famous, and have found solutions to many of the complex problems of motor practice.

The *Oldsmobile* Economy Truck was designed and built with the idea in mind of furnishing dependable and inexpensive transportation for many different lines of activity, serving equally well both the merchant and tradesman, the producer and the shipper. The *Oldsmobile* Economy Truck is not a heavy, lumbering, expensive haulage unit, neither is it intended only for light city delivery purposes; actually it is the happy medium between the two classes.

The *Renault* Truck is another very valuable line, which has lately been added to the firm's already comprehensive lines. Renault products are the "Hall-Mark of Sterling Quality." The three- and five-ton *Renault* Trucks go a long way towards solving the difficulties of satisfactory transportation. The crowning feature of the *Renault* is the accessibility of the engine on account of the position of the radiator, providing for maximum cleanliness and ease of adjustment. The ample clearance is another feature worthy of note.

The name of Boyd Edkins Ltd. is a guarantee of good service, and in addition to the parent organisation in Sydney, they propose establishing a reliable country selling and service agency in all the principal towns of the State, where the owner-driver will be as adquately catered for as the owner in the city.

TURBO-ELECTRIC LOCOMOTIVE

It is reported that a turbo-electric locomotive is being constructed at the Armstrong locomotive works, and that it will be tested on the London and North-western Railway.

The idea is not new, for a good many years ago a locomotive with triple expansion engines driving generators, and delivering current to motors mounted on the axles was constructed in Great Britain. But the great weight of the engine was too much for the permanent way, and after some trials on the North-eastern Railway it was withdrawn from service. The idea of electric drive is to enable an engine to maintain maximum power at all speeds; with direct drive the power output falls just when it is most needed—that is with the falling speed of an engine when ascending a steep grade.

Aviation in Australia

THE new seaplane known as the *Fleetwings*, which performed over Sydney Harbour recently, is one of four machines acquired by Mr. Lebbeus Hordern. It is one of the first of the type known to the flying world, and is appropriately named in view of the fact that the craft registers a speed of eighty miles per hour in the air, while an average cruising speed of sixty miles per hour can be comfortably maintained. From a commercial point of view the machine possesses a feature of great value in that the wings can be folded up when not in use. The tail of the machine besides being fitted with a rudder for surface purposes is equipped with a wheel to take the load when on the ground. The 'plane is fitted with a one hundred and sixty horse-power *Beardmore* engine, and Captain Lang, who acted as pilot in the "stunting" operations, speaks enthusiastically of the craft's sea and air-worthiness.

* * *

Control of Air Navigation.

The Queensland Legislative Assembly has passed a bill dealing with the control of air navigation. The measure is the outcome of the convention held in Paris to determine certain uniform rules in respect of international air navigation. It was subsequently resolved at the Premiers' Conference in 1920 that it was desirable that each of the State Parliaments should refer the matter of control of air navigation to the Federal Parliament, subject to each State retaining certain rights and powers. These powers include: (*a*) Acquisition or ownership by the State of aircraft or aerodromes, or (*b*) use for purpose of Government of the State by aircraft operating within the said State, or (*c*) police powers. The Queensland bill covers these points.

Australian Inventors Alert.

The British Air Ministry's efforts to obtain improvements to the existing methods of aeroplane construction and control, and the invention of new devices has interested several Australian inventors and motor engineering firms. The Civil Aviation Branch of the Defence Department has received a number of inquiries as to the rules and regulations governing the competition promoted by the Director of Research of the Air Ministry, for which it is proposed to award prizes of £1,400, £400 and £200.

The particular object of this competition is to secure a design of a thoroughly safe and reliable fuel tank for service and commercial aircraft. Details of the competition, which commences on the first of the present month, are available at the Civil Aviation Branch, Victoria Barracks, Melbourne.

* * *

Enthusiastic Lady Flier.

A Queensland lady who recently flew as a passenger from Bundaberg to Maryborough in an aeroplane piloted by Lieutenant F. S. Chapman, was most enthusiastic over the experience. She described the sensation of flying as both novel and delightful, and the only disappointment in the whole outing was when the flight came to an end. The journey occupied thirty-five minutes, but even in that brief period an opportunity was afforded of viewing the surrounding country to an extent not possible by any other means. The number of women who, up to the present, have taken on flying in Australia is comparatively small, but the happy experience of the Queensland lady will no doubt induce many others to follow in her footsteps.

* * *

Aerial Mail Services.

The time is fast approaching when a network of aerial mail services will be in operation in Australia. The determination of the Government to inaugurate services between Sydney and Brisbane, and Sydney and Adelaide was recognised as the most progressive move yet made by the authorities in this country to exploit the practically limitless possibilities of commercial aviation. Hitherto there was a tendency on the part of our Governments to regard the day of the aeroplane as "not just yet," but happenings in other countries, and the activities of private enterprise locally have put the matter in a new light. Twelve months hence we may reasonably expect to find every person in the localities served by aerial mail services wondering how they were able to get on without it for so long; and those districts not served in such a way will unquestionably be clamouring for the same facilities as are enjoyed elsewhere.

Whilst it is essential that the Government should take the initial steps in a matter of such national importance as the operation of aerial mail services it is equally important that every inducement should be given to private enterprise to play its part in this great new venture. If the Government adheres to its expressed intention of making the aviation industry as attractive as possible to private enterprise, we may confidently look for a period of great prosperity in the near future.

A photograph taken at the Liverpool Training Camp (New South Wales) of the Officers of the newly inaugurated Royal Australian Air Force, on the occasion of the review by the Governor-General, Lord Forster. His Excellency is the fourth figure from the right in the middle row.

* * *

"Avro" Aeroplane at Grafton.

Captain E. C. Johnson, of the Department of Civil Aviation, Melbourne, arrived in Grafton recently in a one hundred and thirty horse-power *Avro* 'plane on a tour of inspection of the route of the proposed aerial mail service between Sydney and Brisbane. Captain Johnson, who was accompanied by a pilot and one passenger, travelled from Melbourne, and the primary object of the trip was to discover whether the seaplane or the aeroplane is the more suitable for carrying mails and passengers on the route indicated. They were considerably handicapped in their observations owing to the smoke and haze from bush fires which hung thickly over the landscape. Just before reaching Grafton the machine attained its highest altitude (five thousand five hundred feet) on the trip, and even in such a hot district the air at that height was decidedly keen. When it was desired to examine beaches

the 'plane descended to as low as one hundred feet.

From Grafton the party set out for Brisbane, from whence the return trip to Melbourne will be made, *viâ* Moree, Dubbo and Cootamundra.

* * *

Successful Air Tour.

Captain E. W. Percival, who left Richmond aerodrome on November 1 on a tour of the northern districts of New South Wales, reports having had a most successful trip. Muswellbrook, Murrurundi and Tamworth were visited in turn, and from Armidale the aviator proposed flying to Glen Innes, Grafton and thence back to Sydney, *viâ* Tenterfield. A particularly fast run was made between Tamworth and Armidale, the distance, seventy-five miles, being covered in fifty minutes. Captain Percival is an experienced pilot as well as being a fully qualified mechanic.

* * *

Birtle's Long Tour.

The well-known explorer Francis Birtles, recently completed a long aerial tour into Central Australia. He was accompanied by Lieutenant F. S. Briggs (pilot) and Mr. G. E. Bailey (ground engineer). The party left Melbourne on September 26 and flew to Adelaide, from whence Alice Springs (1,000 miles) was reached in four stages.

In speaking of the trip Mr. Birtles mentioned that the police constable at Alice Springs had rounded up the natives to prepare a landing ground for the aeroplane. The natives are an idle, semi-civilised lot, and the bulk of the work is performed by women while the men loaf around. Mr. Birtles is of the opinion that it is better to have greater settlement of people along the coast, and leave the interior for stock raising. One fact which impressed itself forcibly on the minds of the exploring party is the immense value of the aeroplane for survey purposes.

"The route of the north-south railway line should never be settled without the use of the aeroplane," declared Mr. Birtles. "One has only to look over the side to see at a glance more than a camel party could see in six months. It will, of course, be necessary for the aerial surveyor to be well acquainted with the condition of the country otherwise he might be deceived."

Mr. Birtles' party had the distinction of carrying the first aerial mail from Adelaide to Alice Springs, and on the return journey a number of letters, mostly addressed to Adelaide residents, were carried. The machine worked splendidly throughout and the flying time for the last four hundred miles of the return journey from Maree to Adelaide was only four hours.

* * *

Aviation in Queensland.

Addressing a meeting of the Chamber of Commerce at Rockhampton recently, Lieutenant McGinnes, of the Queensland and Northern Territory Aerial Services Ltd., gave some interesting particulars by way of illustrating the practical utility of aviation. His company, he said, had flown an *Avro* 'plane a distance of twenty-one thousand four hundred and fifty miles in Western Queensland during the past six months. Nearly one thousand passengers had been carried, and seven hundred and eighty-nine successful landings had been made. Bearing in mind the crude landing grounds which exist in Western Queensland, this is unquestionably an excellent record, and it is confidently expected that commercial aviation will become a payable proposition in Queensland in the near future.

* * *

Charting the Air.

Mr. H. A. Hunt, Commonwealth Meteorologist, recently journeyed to Perth to ascertain what equipment existed locally which might be made available to assist aviation services. It is the Department's intention, he explained, to provide the contractor of the air mail service along the Geraldton - Derby route with surface meteorological data, and in other ways to assist in overcoming the difficulties it is anticipated will be met with. The amount involved in establishing stations along the mail route will necessarily be heavy when equipment and personnel are taken into account. They will, however, be of very great value in enabling airmen to arrange their services to produce the maximum of safety and efficiency at the minimum of cost. An aeroplane travels through space at a definite speed, and if the air happens to be in motion the aid of the wind added to the speed of the machine—if they are both moving in the same direction, or, on the contrary, if they are opposed—plays an important part in the decrease or increase of the petrol consumption per mile,

and has a big effect on the cruising radius of the machine. This is a matter of very great moment to airmen. By charting the upper air it is quite possible that trade winds will be located moving in directions that will suit aviators at different altitudes. It is frequently the case that when a machine is flying at a certain altitude against a head-wind it is found by ascending a few thousand feet higher that the wind peters out and good progress can be made. It is here where the charting of the upper air will be of immense value to those engaged in all branches of aviation.

* * *

Geraldton-Derby Mail Service.

Arrangements have been completed for the commencement of the first aerial mail subsidised by the Government on December 4.

Owing to the arrangements which have been made at the various landing grounds along the route the first delivery will extend over five days. The schedule provides for the trip to be completed in three days on each succeeding journey. The present steamer mail service between Perth, Geraldton and Derby is only a monthly one, and the vessel takes eleven or twelve days to do the trip. The good wishes of all enterprising Australians will accompany Major Brearley in his new undertaking.

* * *

An Excellent Flying Record.

Lieutenant F. S. Briggs, who has figured so prominently in aviation matters in Australia recently, has an excellent flying record. Since he joined the Royal Flying Corps in 1917 Lieutenant Briggs has flown up to the present more than eighty thousand miles. His latest exploit was as pilot of the machine in which Francis Birtles visited Alice Springs.

Lieutenant Briggs is only twenty-four years of age, and few airmen have had a more varied experience. He joined the Third Light Horse at the age of seventeen. At the conclusion of the war he was engaged in cross-Channel flying, and Mr. W. M. Hughes, Prime Minister of Austarlia, was a passenger on one occasion. Lieutenant Briggs returned to Australia in 1919 and became pilot for Mr. C. J. De Garis.

A BLUE MOUNTAIN PANORAMA

One of the many vantage spots from which glorious panoramic views of the Jamieson Valley may be obtained.

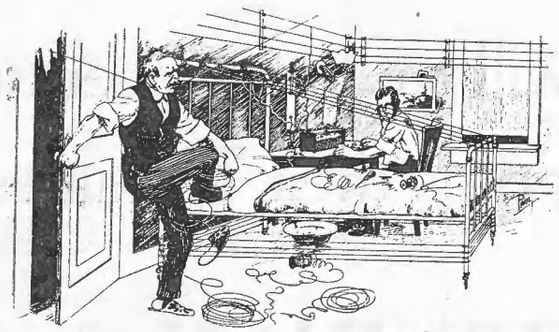
RADIOMANIA

By CHARLES S. WOLFE*

AFTER all, why not? De Quincy did his "Confessions of an Opium Eater" with just as little justification and got away with it, and it is possible that this revelation of my own dark past may strike a responsive chord in the breast of some other wight who, in his time, has suffered from Radiomanio.

Why not? And yet, why? Unless I have some kind of a hazy idea that it may serve as a guide to the newly bitten ham. Not that it will prove to be such an admirable guide to the methods of procedure in such cases, but as a "How To Do It" article all I ask is a clear field and no favour.

The thing dates back to that momentous evening when my ears were for the first time irritated by the clamp of Holtzer Cabots. The only thing about the outfit that was mine, barring the good intentions, was the ears. The set (I owe it to the chap to call it that) belonged to a new found friend of mine. If I am ever called on to testify before a jury of my peers as to the most envious moment of my life, I will be able to say without hesitation that it was that instant when I first heard the bell-like whistle of N.A.A.—on another man's set.



Father had occasion to come into my room one night, and next day we discussed the erection of an outside aerial!

True, he was only heard after two hours of patient coercion of an innocent lump of galena with a piece of brass wire. But at the first shrill piping I knew that I was a gone gosling. My very pocket-book trembled, and you can take it from me, it had cause to.

For the next two weeks the only minutes that I can recall as being spent with my nose outside of a catalogue were those intervals when I was dreamily reflecting. Reflection is the only cheap part of the radio game that I have ever been able to discover.

Having resolved to acquire a station, my first manœuvres were purely diplomatic ones, calculated to feel out the family policy in the matter. I remarked in an offhand way to my father that the papers were full of wonderful yarns about this wireless telagraph business, and that I had heard that there were a couple of chaps in our town fooling with it. I made this little feeler with the air of utmost innocence, but long acquaintance with yours truly (father was the first man I ever boarded with) had rendered father able to read between, around, above, and through the lines, and he failed to rise to the bait. He merely replied—and I must admit that his air of innocence made mine look like an open confession of guilt—that in his estimation the person who first jabbed holes in a perfectly good tin roof should pass the remainder of his life in the electric chair.

It is only fair to this stern and adamant parent that he should go down in history as the same man who, some two or three weeks later, cursed fluently and expressively as he aided me to point a pair of twenty-foot spruces skyward.

To resume. My first experiment in the new art was classic. It deserves to trickle down to posterity along with Benny and his kite.

The very first piece of apparatus that I purchased (I have the purchasee's word for it that it was apparatus) was a receiving condenser. It had been constructed by this eminent radio engineer himself, and, having been unable by any means to make it function, he passed it on to me—for a consideration. No doubt his justification was that I had more time to fool with it than he had.

It would certainly give me much pleasure

* In *Radio News.*

to hold that poor old dust-covered relic up before my grandchildren and say, "Here, my dears, is the very first piece of wireless apparatus that your renowned grandpa ever owned." That simple pleasure is denied me. The condenser is no more. It has been no more since three days after I took it unto my bosom. I fear that at that period my bosom was no fit place for a struggling receiving condenser. My second purchase was a one-inch spark coil.

I bought that coil because the catalogue said that it would give a good, hot spark, and I had a deep-rooted idea that a good, hot spark was more to be coveted than great riches. If that unfortunate condenser's ghost could be hailed back from the Great Beyond to bear witness, I am positive that it would cheerfully swear that all the claims made by the manufacturer about that good, hot spark were Gospel truth. It ought to know.

Well, when the cunning little white flames had ceased playing through the in'ards of the receiving condenser I had about reached the conclusion that the guy who put out the bunk about connecting a condenser across the secondary terminals of a spark coil was a malicious liar.

Somewhat daunted by the suddenness of the fate that overtook my tinfoil beauty, I apandoned *pro tem* my attempts to shatter the ether, and turned from the emitting of etheric nuisances to the waylaying of a few. I stalked them with caution, being on totally unfamiliar ground. The catalogue on which I pinned my faith spoke glowingly of the possibilities of the indoor aerial—glowingly, but, I fear, somewhat hazily. The details were, for the most part, left to the imagination. My imagination is quite capable of some startling acrobatics if given anything like a loose rein, but in this case it was hampered somewhat by the dearth of materials at hand.

We began operations by stringing hence and thence across my bedroom a regular maze of annunciator wire. For several days navigation within that room called for considerable skill. For even assuming that you escaped decapitation when you entered the door it availed you little—you were almost sure to be unchinned before you reached the gas fixture. And once in bed, it behoved the novice to do all his sleeping within six inches of the pillows. Any sudden changes in elevation were well nigh bound to prove fatal. It was by sleeping in this room for a whole week with that contraption that I won my family reputation for valour, a reputation which endures even unto the present day.

It must be recorded that I never heard anything on this forerunner of the loop. I have often thought since, though, that I would quite likely have gotten the arc light on the street corner had I had a detector of some sort to hook into circuit. It was later that I learned that the 'phones are not most efficiently placed when they are connected to the primary of a loose coupler.

Father had occasion to come into my room one night, and the next day we discussed the erection of my big outdoor aerial. Peace at any price was the keynote of his attitude throughout the council.

The very first evening that I completed the installation of my first real receiving station, I got signals. Old Sayville had not yet fallen from grace, and nightly his "press" was tearing great gaps in the atmosphere. I had listened to this larklet for about two minutes when I realised that I held the cup of Tantalus in my hand. I could hear that bird without the least bit of trouble, but he might well have been sending in the purest Martian. I couldn't understand a darned thing he said.

When this cataclysm was realised by the household, father assumed the air of a martyr. He was wont to roam out into the night and gaze wistfully up at those neat twenty-footers. His yearning stare fairly shouted, "You'll keep the home fires burning for a couple of hours, but what in hell will I do with all that wire?"

Nettled, I went to the mat with the Continental code, and the day came when those flying combinations whispered perfectly understandable English in my ear.

On the evening that I first captured the scores as hurled forth by Arlington, father took back all the unkind thoughts he had ever harbored. He used to sit majestically enthroned on the front stoop in the early evening while all the neighbourhood holders of those little red tickets flocked humbly around him and computed their losses for the day.

Pride goeth before a fall. The crash of Babylon produced no greater upheaval in the community than did the collapse of my aerial in our neighbourhood. The sheer

efficiency with which that thing fell has always been a source of wonderment to me. That such a little thing could do so much damage in so short a time surpasseth all understanding. Of course, the bill reached its really startling proportions by reason of the fact that the outfit arrived all at once, so to speak, in Jones's greenhouse. The roof of that institution did not deter it in the least.

We bartered more or less successfully with Jones. He was a coarse man, and seemed to value a few scrawny tomato plants above the onward march of science. Eventually we led the erring spruces once more roofward, where they remained until I hocked the whole outfit.

I developed a mania for freak apparatus, and some of the creations which have graced my table would make any radio engineer froth at the mouth. To the beginner I can only say, don't do it. I realise that you will just the same. We all do.

About this time some one called my attention to DeForest's notorious experiments *in vacuo*. He began, it seemed, with nothing, and evolved seven dollars and fifty cents worth of electric light and about eighteen dollars worth of contributory and accessory apparatus. I could ill afford it, Heaven knows, but needs must when the Bug drives, and eventually my 'phones were outraged nightly by the high plate voltage. The advent of this necessary evil, with its inevitable storage cell, marked the downfall of an heretofore irreproachable carpet. It was, in the eyes of my mother, a carpet of the first magnitude, but sulphuric acid is no respecter of carpets. Be it remarked, *en passant*, that I did not escape scathless.

So it went, one step followed by two steps, that by endless lamps, until in desperation I was about to turn once more to silicon and endeavour to start all over again, when, as suddenly as the disease had seized me, it quitted me. One night I was an ardent fan, the next morning I awoke with a positive distaste for all things radio. After vainly striving to arouse some enthusiasm, I swore off with a finality that left no doubt as to the sincerity of my intentions. I haggled for days with the Faithful, disposing of every last piece of my once cherished outfit and turned to pastimes new. I was done. D-O-N-E spells "through." I was out. It was over.

I have been back just four times since the irrevocable quit, and I haven't the slightest doubt that unless I am called into unexpected consultation with Peter I shall have that many more excursions. Don't try to throw the thing. It can't be done.

MOTOR CARS AND ROADS IN AMERICA

Recent travellers from America have commented upon the comparatively few horses that are now used in transport work of any kind in that country. In California the most striking example of the popularity of motor vehicles is the fact that there are close on half a million cars in that State alone. The task of finding garages to house them all is almost as acute as the problem of providing houses for families in Australia, and is certainly causing the municipal authorities quite as much anxiety. In Los Angeles a nine-story garage, capable of accommodating one thousand cars has recently been erected. Los Angeles now boasts a population of 750,000, the number having increased by no less than 93,000 during the past twelve months. Cement roads are becoming widely popular in the States, and one may travel over them for thousands of miles at a stretch. With motor vehicles forming the bulk of the traffic it is easy to understand the popularity of the cement surface owing to its hard-wearing qualities.

CAN YOU BEAT IT?

Speaking on the subject of the present trans-Atlantic scheme of wireless telegraphy, and having been informed by "Sparks" that transmitting stations were situated in New Brunswick, N.J., and Glace Bay, Nova Scotia, on the American side, an Englishwoman recently travelling on the *Makura*, asked: "And in what part of England are they *trapped?*"

(It would be pleasing to know what kind of "trap" is being used on the European side, so that we could set it for these "QRU? Johnies," who are getting so plentiful this end of the Pacific.)—F.A.H.

WIRELESS INSTITUTE OF AUSTRALIA

NEW SOUTH WALES DIVISION

FOR general information, it is notified that this Division has obtained a private letter box at the General Post Office, Sydney, and all correspondence is now to be addressed as follows:

The Honorary Secretary,
Wireless Institute of Australia,
New South Wales Division,
Box 3120, G.P.O.,
Sydney, N.S.W.

A General Meeting was held on Tuesday, November 8, at 7.30 p.m., at "Wireless House," Sydney.

The Chairman was Mr. Chas. D. Maclurcan, and thirty-five members were present.

The minutes of the previous meeting were read and confirmed.

The election to membership of the following gentlemen was then conducted:

Associate Members:
H. D. Trinder, 49 Myrtle Street, Sydney.
A. F. Peters, Carlisle Street, Rose Bay.
W. G. Best, Carlisle Street, Rose Bay.
T. A. Morgan, 61 Kareela Road, Cremorne.
T. F. Rollason, Rose Street, Oatley.
F. H. Kirby, 14 Henry Street, West Kogarah.
H. W. Crawford, Penshurst Street, Penshurst.
G. M. Colton, 4 Culdees Road, Burwood Heights, Enfield.
R. R. Wilshire, Help Street, Chatswood.

Members:
R. E. Mann, "Myuna Radio," Upper Orara, N.S.W.
G. B. Conley, Penshurst Street, Penshurst.
W. E. Hilton, Oxley Street, Crow's Nest.
R. F. Grosvenor, Homebush Road, Strathfield.
E. B. Crocker, 14 Roseby Street, Marrickville.
R. D. Charlesworth, 173 Parramatta Road, Haberfield.
F. T. Neal, 100 Bland Street, Ashfield.

The chairman then announced that entries for the Wireless Telephone Receiving Competition closed at this meeting. Altogether twenty-five entries were received.

The business of the evening, "Calibration of Members' Apparatus" was then undertaken by Mr. E. A. Burbury. There was a considerable amount of apparatus presented and Mr. Burbury, assisted by Mr. S. N. Newman, a member of the Victorian Division, conducted the measurement of inductances, whilst Mr. Maclurcan, assisted by Mr. Stowe, undertook the measurement of capacities.

On the completion of the work, a hearty vote of thanks was conveyed to Mr. Burbury, who briefly responded. A vote of thanks was then conveyed to Mr. Maclurcan for his assistance, and the meeting closed at 9.45 p.m.

SOUTH AUSTRALIAN DIVISION

THE Monthly General Meeting of the South Australian Division of the Wireless Institute of Australia was held at Alfred Chambers, Currie Street, Adelaide, on Wednesday, November 2, 1921, Mr. J. M. Honner occupying the chair.

The minutes of the previous meeting were read and confirmed.

A letter was received from the New South Wales Division requesting that reports of the meetings of this Division be forwarded to the Editor of *Sea, Land and Air*, so that they may be published regularly in the official journal of the institute.

It was pointed out that reports of this Division's activities are published every month, and it is to be hoped that the other Divisions will make up and send in their reports. One would hardly know that there was a Division of the Wireless Institute in some of the States, so seldom is anything heard of them, and even when they are communicated with direct no reply is received! It is hoped that this matter will be rectified, and that reports from all Divisions will, in future, be forwarded to *Sea, Land and Air* for publication.

Two new applications for membership were received.

Mr. H. L. Austin gave a very interesting lecture on the "Care and Repair of Accumulators." He exhibited a number of plates showing the effects of over-charging and under-charging, and explained the causes of sulphating and other defects to be found in accumulators.

At the close of the meeting the chairman called for a vote of thanks to the speaker, which was given by hearty acclamation.

At the next meeting to be held on December 7, Mr. C. E. Ames will lecture on "Receiving Sets."

LIST OF WIRELESS OFFICERS ATTACHED TO VESSELS OF THE AUSTRALASIAN MERCANTILE MARINE

Revised to November 16, 1921.

SHIP.	OPERATOR.
Aeon	T. G. McEwan
Alabama	G. W. Rowland
Aldinga	G. I. Betteridge
Arafura	J. H. Hawkins
Arahura	G. M. Gormlie
Araluen	H. H. Black
Aramac	F. L. Scott
Arawatta	———
Aroona	J. Doggett
Ashridge	J. Carty
Atua	———
Australbrook	J. E. Cleary
Australcrag	S. J. McVeigh
Australford	H. E. Young
Australglen	W. A. MacDonald
Australmead	F. Ouvrier
Australmount	G. Vincent
Australpeak	J. B. Ponsonby
Australplain	A. Stuart
Australpool	E. J. Glaisher
Australport	E. J. Giles
Australrange	E. F. Hayes
Bakara	G. Maxwell (s) S. R. Haworth (3rd) T. O. Sexton (3rd)
Baldina	A. W. Hooper
Bambra	R. C. Williams
Barambah	M. L. Robertson
Barunga	S. M. Brown
Bingera	———
Bombala	H. F. Harman
Boonah	F. A. Cook
Booral	T. V. Tressler
Boorara	T. Alexander (s) L. C. Farnsworth (3rd) G. T. Davies (3rd)
Bulla	R. T. Stephen
Bunninyong	H. Bashford
Burwah	W. R. Baird
Calulu	R. C. Dymond
Camira	R. L. Beatty
Canberra	———
Carina	V. E. Stanley (s) H. F. Tye (3rd) A. C. Hickey (3rd)
Cantara	J. F. McGinley
Ceduna	E. T. Prentice
Century	W. H. George
Changsha	A. S. Smith (s) J. W. Fairley (2nd) K. T. Harrison (3rd)
Charon	A. G. Ross (s) J. R. Kennedy (2nd) E. W. Burrows (3rd)
Chronos	P. C. Gillon
Cooee	A. W. Benn
Cooma	V. M. Brooker
Delungra	W. Hill
Dilga	H. F. Giles
Dilkera	R. H. Alexander
Dimboola	R. T. Murray
Dinoga	R. W. Barnes

SHIP.	OPERATOR.
Dongarra	H. J. Byrne
Dromana	F. Stevens
Dumosa	R. J. Webb
Dundula	N. W. Marshall
Eastern	F. Exon (s) E. McPherson (2nd) J. Carew (3rd)
Emita	W. Reithmuller
Enoggera	A. L. Short
Era	P. J. Manley
Eudunda	———
Echuca	———
Eurimbla	———
Eromanga	A. H. Jeremy
Erriba	———
Eurelia	F. Marsden
Flora	J. G. Henderson
Gilgai	A. S. Dening (s) N. Olsen (2nd) F. Kettlewell (3rd)
Gorgon	I. R. Hodder (s) T. M. Johnson (2nd) H. M. Watson (3rd)
Goulburn	A. R. Catford
Hexham	A. R. Smith
Hobart	C. J. Lilley
Hwah Ping	H. F. Hartley
Iron Baron	C. C. Ullman
Iron Monarch	J. W. McKay
Iron Prince	J. M. Camps
Junee	J. R. Gilligan
Kadina	J. A. Guy
Kaiapoi	E. A. Miller
Kaikorai	———
Kaimanawa	———
Kangaroo	C. W. Scrivens (s) C. W. Carthew (2nd) J. Baird (3rd)
Kaitangata	N. W. G. Scott
Kaitoko	———
Kaituna	W. A. Hawkins
Kaiwarra	L. E. Ternes
Kanna	K. L. McSwan
Kanowna	———
Karoola	R. R. Pilmore
Karori	M. Webb-Watts
Katoa	J. H. Bennett
Katoomba	T. A. Jones
Kauri	———
Kawatiri	———
Kekerangu	R. P. Ginders
Komura	W. H. Jowett
Kooringa	V. J. Foreman
Koonda	M. G. Crockett
Kooyong	E. S. Bailes
Koromiko	I. B. Gibson
Kowarra	H. Fullerton
Kurow	———
Lameroo	J. Elmore
Levuka	A. W. Watt
Loongana	———
Macedon	G. Poole

(Continued on next page.)

(Continued from last page.)

SHIP.	OPERATOR.
Mackarra	S. L. Filer
Macumba	W. J. Washbourne
Maheno	G. H. Hugman
Maindy Lodge	H. S. Chown
Makambo	M. A. Prudence
Makura	F. A. Hunter (s) N. M. Leeder (2nd) P. J. Banney (3rd)
Malayan	———
Mallina	A. G. Dixon
Manuka	J. A. Heavey
Maori	———
Mapourika	C. F. G. Taylor
Marama	C. F. Griffiths (s) O. Ling (2nd) C. Drew (3rd)
Mararoa	G. Illingworth
Marella	W. H. Harris (s) H. W. Barnfield (2nd) G. J. Flynn (3rd)
Marawah	J. L. Skinner
Marsina	A. Cuthill
Mataram	C. H. A. Kidman
Maunganui	———
Melbourne	A. B. Monks
Melusia	E. J. Giles
Merriwa	J. H. Pullen
Milluna	J. Overbury
Minderoo	J. G. C. Higgins (s) A. F. Plowman (2nd) S. Kings (3rd)
Mindini	R. Jordon
Moana	———
Moeraki	———
Moira	S. V. Blight
Mokoia	———
Monaro	G. H. Hore
Monowai	———
Montoro	A. L. Dixon (s) W. S. Ringrose (2nd) F. B. Harris (3rd)
Morinda	F. C. Davies
Nairana	C. F. Green
Nardoo	R. McNamara
Navua	———
Ngakuta	S. G. Bargrove
Niagara	W. J. Martin (s) E. W. Coldwell (2nd) R. G. Wright (3rd)
Ooma	A. E. Sheppherd
Oonah	F. G. Forrest
Paloona	G. M. Whiteside
Parattah	K. L. Simpson (s) E. C. Bouel (2nd) E. Pollard (3rd)
Period	H. Wormwell
Perth	M. A. H. Ryan
Rakanoa	———
Riverina	L. G. Devonport
Rotomahana	———
Saros	H. Warner
South Africa	S. R. Dixon
St. Albans	T. Bannister
St. George	S. G. Jones
Suva	L. S. Lane
Tahiti	F. E. Duggan (s) L. H. Jones (j)
Taiyuan	J. H. Wilkin
Talawa	———
Talune	———
Tarcoola	A. D. R. Davis
Time	T. J. O'Leary
Tofua	L. R. Dickson
Toromeo	M. Sedgers
Ulimaroa	H. Tuson
Urilla	———
Victoria	W. H. Richardson
Waihemo	C. Williamson
Wahine	R. S. Taylor
Waihora	E. A. Hunter
Waikawa	V. P. Nevins
Waikouiti	J. A. Cooper
Waimarino	F. L. Dawes
Waiotapu	T. H. McWilliams
Waipori	———
Wairuna	F. N. Davidson
Waitemata	———
Waitomo	E. M. Bain
Wanaka	G. Cook
Wear	L. F. O'Donnell
Werribee	R. G. Inglis
Westralia	D. N. Quinn
Whangape	A. O. Sutherland
Waingatui	A. E. Laurence
Wodonga	G. Pow
Woolgar	J. Glennie
Wyandra	T. Chalmers
Wyreema	———
Yankalilla	W. C. Lucas
Zealandia	B. Boni

OUR QUESTION BOX

A. W. H. McDonald (Sunny Corner).—In reply to your inquiry we have to advise that similar phenomena has been experienced at various times by other wireless experiementers, operators and engineers. It is due to banks of highly charged atmosphere in the vicinity, which charges the aerial, which in turn discharges to earth by the path of least resistance.

"Galena" (Cooee).—Your hook-up is O.K., and the results you are obtaining are very good. With a coupled circuit, employing a loose coupler and variable condenser you should easily hear Adelaide and Sydney radio stations. In the coupled circuit connect the variable condenser and secondary of loose coupler in parallel, and from those two leads connect the detector, 'phones and 'phone condenser in series.

G.S.W. (North Castlemaine).—(1) Load factor is the aeronautical equivalent of factor of safety used in engineering sense. (2) End load on wings is the load produced in the spar by the tension, in flight, on the lift bracing wires. (3) The bore of the 80 h.p. *Le Rhone* engine is 105 millimetres, and the stroke 140 millimetres. (4) The *Zeitlin* 220 h.p. rotary engine is only in the experimental stage, and is not used extensively.

E. Tarran (Campsie).—We do not know of any Australian shipping company which takes boys as apprentices to learn wireless on board ship. We have asked the principal shipping company's, and although several of them carried apprentices before the war they are not doing so now. We suggest you communicate with the wireless school whose advertisement appears in this issue.

SUCCESSFUL AERIAL TOUR.

THE Australian Aircraft & Engineering Co., of Sydney, last month sold a standard type *Avro-Dyak* aeroplane to Mr. A. D. Reid, of Pioneer Station, Lower Burdekin, North-west Queensland. Just as we are going to press the A.A. & E. Co. advise having received the following telegram from Mr. Reid:

"Arrived safely in Ayr after successful tour through Western Queensland and Northern Territory."

Mr. Reid is using the *Avro-Dyak* both for commercial and pleasure flying.

WIRELESS CALL LETTERS

SUPPLEMENTARY LIST NUMBER TWO

	Station.	Call Signal.
S.S.	*Patrician*	BDI
S.S.	*City of Birmingham*	BDS
S.S.	*Bardic*	BEM
S.S.	*Rona*	BIQ
S.S.	*Discoverer*	EIF
S.S.	*Clan Morrison*	EIR
S.S.	*Clan Ranald*	EIT
S.S.	*Benavon*	EJD
S.S.	*Queen Alexandria*	ELN
S.S.	*Langton Hall*	ELS
S.S.	*Saxilby*	ELW
S.S.	*Waitemata*	ENV
S.S.	*Grelstone*	EPF
S.S.	*Port Augusta*	EPN
S.S.	*Zinal*	EQJ
S.S.	*Scottish Monarch*	ERS
S.S.	*Erroll*	ERZ
S.S.	*Atlantic City*	ETY
S.S.	*Geddington Court*	EUN
S.S.	*Clarissa Radcliffe*	EWF
S.S.	*Norwich City*	EXB
S.S.	*Hampstead*	EZT
S.V.	*Chateau d'If*	FBD
S.V.	*Colonel De Villebois-Mareuil*	FBF
S.V.	*Marechal de Turenne*	FBO
S.V.	*Marechal Suchet*	FBP
S.V.	*Amiral Cecille*	FDD
S.V.	*Bouchamp*	FDH
S.V.	*Bonneveine*	FDJ
S.V.	*Bossuet*	FDK
S.V.	*Desaix*	FEA
S.V.	*Duquesne*	FEB
S.V.	*Edmond Rostand*	FED
S.V.	*Eugene Schneider*	FEI
S.V.	*General de Negrier*	FEM
S.V.	*Genevieve Mollinos*	FEQ
S.V.	*Germaine*	FER
S.V.	*Joinville*	FEW
S.V.	*General Foy*	FHP
S.V.	*Crillon*	FHQ
S.V.	*Andre Theodore*	FLY
S.V.	*St. Louis*	FOB
S.V.	*Suzanne*	FOC
S.V.	*Vincennes*	FOI
S.V.	*Pampa*	FVP
S.V.	*Cornil-Bart*	FZP
S.V.	*Bretagne*	FZY
S.S.	*City of Naples*	GEO
S.S.	*Roseric*	GLY
S.S.	*Muttra*	GMJ
S.S.	*Portuguese Prince*	GRS
S.S.	*Titan*	GSO
S.S.	*Otarama* (ex *Ajana*)	GTI
S.S.	*Clan Macquarie*	GVL
S.S.	*Stockwell*	GZJ
S.S.	*Brockfields* (ex *Crostafels*)	GBDX
S.S.	*Eastminster Abbey* (ex *Heilbronn*)	GBFD
S.S.	*Trewinnard* (ex *Amimon*)	GBPZ
S.S.	*City of Batavia* (ex *Ganelon*)	GBRP
S.V.	*Vendee*	HRJ
S.S.	*St. Antoine*	HVW
S.V.	*France*	HWF
S.S.	*Piave*	IEL
S.S.	*Lepanto*	IEX
S.S.	*Marina*	IMO
S.S.	*Monte Bianca*	ILD
S.S.	*Adda*	IPG
S.S.	*Vittoria*	IWY
S.S.	*Racconigi*	IZJ
S.S.	*Yamato Maru*	JBW
S.S.	*Mitsuki Maru*	JDB
S.S.	*Tofuku Maru*	JDD
S.S.	*Singapore Maru*	JSP
S.S.	*Hokkai Maru*	JYP
S.S.	*West Wind*	KJH
S.S.	*West Hepburn*	KINP
S.S.	*City of Sydney*	KKEI
S.V.	*John W. Wells*	KOCR
S.S.	*Havo*	LDC
S.S.	*Rinda*	LEU
S.S.	*Simla*	LEW
S.S.	*Atna*	LFC
S.S.	*Rena*	LFD
S.S.	*Tysla*	LFF
S.S.	*Bonna*	LFX
S.S.	*Clan Macfadyen*	LSG
S.S.	*Clan Murray*	LSR
S.S.	*Ben Lomond*	LTC
S.S.	*City of Winchester*	LUC
S.S.	*Maihar*	LUQ
S.S.	*Manaar*	LUR
S.S.	*City of Chester*	MAG
S.S.	*Baron Jedburg*	MGD
S.S.	*Cassis*	MPO
S.S.	*Kansas*	MRW
S.S.	*Pembrokeshire*	MUT
S.S.	*Inventor*	MVY
S.S.	*Natica*	MZN
S.S.	*Ranella*	MZP
S.S.	*Clan Matheson*	MZQ
S.S.	*Moora*	OCA
S.S.	*Mahratta*	OCM
M.S.	*Annam*	OZN
S.S.	*Chile*	OZV
S.S.	*Bandoeng*	PEW
S.S.	*Medan*	PGA
S.S.	*Menado*	PGB
S.S.	*Batjan*	PGV
S.S.	*Bawean*	PHJ
S.S.	*Bengkalis*	PHZ
S.S.	*Tosari*	PIO
S.S.	*Ombilion*	PMA
S.S.	*Batoe*	PYQ
S.S.	*Walcheren*	PZH
S.S.	*Sydic*	SGF
S.S.	*Yeddo*	SHF
S.V.	*G. D. Kennedy*	SGV
S.S.	*Bolmen*	SHA
S.S.	*Sloterdijk*	TVE
S.V.	*Dieppedalle*	UBJ
S.V.	*Amiral Halzan*	UCZ
S.S.	*Kangaroo*	VHM
S.S.	*South Africa*	VNS
S.S.	*Calulu*	VZV
S.S.	*Easterner*	WGEA
S.S.	*Morristown*	WGAI
S.S.	*Treglisson*	XEM
S.S.	*Canadian Ranger*	XFF
S.S.	*Naldera*	XIN
S.S.	*Narkunda*	XIO
S.S.	*Clan Macbean*	XJD
S.S.	*Glenapp*	XKF
S.S.	*Port Sydney*	XLU
S.S.	*Woodburn*	XMA
S.S.	*Polshannon*	XUK
S.S.	*Benwood*	YCA
S.S.	*Willaston*	YCP
S.S.	*Glensloy*	YDF
S.S.	*Baron Minto*	YEK
S.S.	*Glenmoray*	YEP
S.S.	*Redbridge*	YHQ
S.S.	*Clan Sutherland*	YJP
S.S.	*Benlawers*	YJS
S.S.	*Astyanax*	YKF
S.S.	*Ferngarth*	YKR
S.S.	*Atlantic*	YLJ
S.S.	*Benarty*	YLT
S.S.	*Portsea*	YQH
S.S.	*Eurybates*	YRH
S.S.	*Australia*	YSN
S.S.	*Priam*	YTO
S.S.	*Clan Buchanan*	YVZ
S.S.	*Clan Mackinlay*	YXC
S.S.	*Moorish Prince*	YYK
S.S.	*Knowsley Hall*	YYW
S.S.	*Cyrena*	ZAW
S.S.	*Sagama River*	ZEK
S.S.	*Tregarthen*	ZDE
S.S.	*Yoseric*	ZFN
S.S.	*City of Manchester*	ZGG
S.S.	*Rhesus*	ZII
S.S.	*Telamon*	ZKA
S.S.	*Polladern*	ZMH
S.S.	*Port Lyttelton*	ZPD
S.S.	*Cornish Point*	ZPE
S.S.	*Clan Stuart*	ZPN
S.S.	*Grelcaldy*	ZUW
S.S.	*Queen Alexandria*	ZWB
S.S.	*Hartlepool*	ZWS
S.S.	*Doonholm*	ZXM
S.S.	*Normanstar*	ZXR

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— OF —

TOPICAL INTEREST

OFFICIAL JOURNAL OF
THE WIRELESS INSTITUTES OF AUSTRALIA AND NEW ZEALAND.
THE MERCANTILE MARINE WAR SERVICE ASSOCIATION OF AUSTRALASIA.

Edited by S. E. TATHAM.

CONTENTS

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

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All Editorial communications should be addressed to THE EDITOR, *Sea, Land and Air*, 97 CLARENCE STREET, SYDNEY.

Sole European Agents: THE WIRELESS PRESS, LTD., 12 AND 13 HENRIETTA STREET, LONDON, W.C. 2.

Sole Agents for United States of America: WIRELESS PRESS INC., 233 BROADWAY, NEW YORK.
Singapore: KELLY & WALSH.