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SCIENCE AND HUMANITY

Especially Written for "Sea, Land and Air" by "LUCANIA"

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Twelve months ago the writer contributed a short article to *Sea, Land and Air* under the above title. In that article the scientific achievements of the age were summarised, the failure of man to cure his international and social difficulties was referred to, and the inevitable defeat of Germany foreshadowed.

That failure and the German defeat, in spite of the wonders of scientific achievement, were attributed to the neglect of the science of human life.

Although the great enemy of civilisation has met with irrecoverable defeat, the world to-day is still suffering many terrors, and our civilised life is threatened by grave dangers. The international problem is yet unsolved, social problems are growing more difficult, and pandemic disease is destroying millions of lives.

Disorder, ruin, oppression and ravage are stalking through Europe and threatening other countries. The oppressed, led by the aggressive, are striving for mastery, and where that is gained they become more cruel and oppressive than their former enemies.

Man's attempts to prevent and destroy the spread of a serious disease have proved unavailing after three years. Its history in other countries shows that it appears and re-appears with increased virulence, and, so far, the thousands of skilled medical men have failed to provide a sure protection or cure, or even to determine its nature and cause.

Such facts make doleful reading, and no one will deny that the combined effect has proved widely depressing in the world of thought. The case looks hopeless and useless when viewed from one standpoint, yet "hope springs eternal in the human breast."

Looking in another direction, into the realm of so-called material things, we view an entirely dicerent picture: a prospect illuminated with the wonderful achievements of civilised man and filled with possibilities which dazzle the imagination.

We see the steady conquest of time and space as man learns more and more of the laws of the universe.

Through repeated trial and error, through experimental research and logical

deduction, man's knowledge and his powers are increasing at a rate which astonishes himself.

The science of flying, founded on knowledge of mechanics and physics, aided by skill and determination, has arrived at a stage of immeasurable value. No two places on the face of the earth are separated by more than ten days travelling for a modern aeroplane.

Wireless communication, which has its foundations in the sciences of electricity, mathematics and physics applied through human effort and skill, is advancing with rapid strides to the point where the human voice will be heard between the remotest parts of the earth, while its foremost and brilliant pioneer, Marconi, has placed his great name and experience behind a statement that communication with other worlds is within the range of possibility.

Here, then, are two entirely different pictures, one depressing and hopeless and the other wonderful and inspiring. Between those two rests the most ancient and ultimately the greatest factor in human life—religion—represented to-day by the numerous sects and churches, which are widely disregarded and powerless to help.

Where is the solution of our great paradox? Shall we find it and eventually arrive at the much advertised millennium, or shall we go headlong into chaos and destruction and the so-called "end of the world?"

In the writer's mind the answer is clear and unmistakable!

If the great mass of civilised peoples could be divided into sections we should undoubtedly find a majority clinging to some hope or doctrine, most of them believing that their particular doctrine or theory is a panacea for all human troubles, and a large number convinced of the necessity and justification for *forcing* the adoption of each particular method upon the remainder; forgetting, in their enthusiasm, the fundamental right of individual freedom and selection.

Among the sections we should find autocracy, bureaucracy, democracy, industrialism, capitalism, socialism, syndicalism, bolshevism, materialism, spiritualism, revolutionists, evolutionists, imperialists, nationalists, eugenists, rationalists, theologians, theosophists, atheists, and others too numerous to mention, also thousands of

subdivisions such as Anglicans, Catholics, Baptists, Nonconformists.

In addition to these are the numerous racial and national divisions, making the human family still more heterogeneous and complex. These are the circumstances in which the idea of a world's peace and a League of Nations sounds like an impracticable dream, and the "Parliament of Nations a Brotherhood of Man" seems an impossibility.

On the other hand let us explore briefly the factors underlying man's marvellous progress in scientific and mechanical achievement, which has led to the modern wonders of aviation, wireless, spectrum analysis and radioactivity.

It would be a mistake to credit these things to the *creative* genius of man. Man has not *created* any one of them, his work has been that of discovery and application; discovery of existing natural laws (or better, *laws of nature*) and application of his discoveries to useful purposes.

These laws are fundamental, they are part of the origin of all things, and their own origin belongs to the ultimate secret of universal existence.

It is not within the power of man to alter nature's laws, but man can, according to the extent of his knowledge and his own desires, use them rightly or wrongly. He can, so to speak, work in harmony with or in opposition to any law which he discovers, and his results will accordingly be good or bad, constructive or destructive.

In any of the physical sciences man can get the same results from the application of natural laws, whether he uses them in Japan or Labrador, in Chile or in Scotland. So long as he understands the law, the man himself may be a Chinaman or a Welshman. Nationality, doctrines, creeds or interests make no difference; the laws of nature, which are the laws of the universe, the laws of the Creator and the laws of God, are not affected by and therefore do not recognise such divisions.

It is by patient and devoted work and experiment that man has discovered the laws so far understood. By such means he has interrogated Nature and Nature has answered with the truth.

Such laws or truths as have been discovered are universal. If an Italian wishes to use an aeroplane he must apply the laws of flight in exactly the same manner as an Englishman. If a German wishes to speak

by wireless he must employ common principles just as much as if he were a Chinaman.

From this we see that where progress has been made it has been by the discovery of universal laws made by the Creator of all things and by their proper use. Not by human doctrines and theories, which vary with race, creed, politics, and locality.

With this understanding it becomes quite clear that there is no limit to the possibility of man's discoveries. His ultimate achievements have no boundary line to be marked "thus far and no further," because there is no logical reason to suppose that we cannot go on discovering and applying more and more the laws of nature.

It is therefore impossible to believe that this wonderful growth of knowledge and achievement is intended to come to naught; to be lost in chaos and common destruction. All the known laws of nature and all our ideas of science deny such a supposition. The works of nature are infinite (unlimited) and omnipotent (all powerful), and it is man's heritage to understand them and co-operate.

We now see a wonderful and an unlimited vista of human possibilities; yet why do we suffer so many limitations and terrors in our social and international affairs?

Let us reason by analogy, and imagine what the results would be if we built a large number of machines and attempted to fly without first discovering and then applying the laws of nature governing flight, or if we divided ourselves into a large number of groups, each group having a different theory or method, being intolerant of the others, and not attempting to discover the common or natural laws.

In the world of electricity it is easy to realise what chaos and destruction would result if the fundamental laws of electricity were disregarded by those who supply our light and power, or if we employed untutored men to design and operate our electrical machinery.

Since the laws of what we term physical science were made by the same Intelligence which created human and all other life, we must realise that there are fundamental or natural laws governing the origin, growth and conduct of mankind, and consequently there must be a "science of humanity."

Therefore the solution of the problems of humanity is no more impossible than the

solution of the problems of wireless communication and of flight. "Seek and ye shall find, knock and it shall be opened unto you" are the words of the greatest Teacher and the greatest exponent of human science.

In this direction lies the greatest need of scientific enquiry and achievement, as well as the most alluring possibilities. In nearly all experimental science we progress by the observation of a number of variable factors, and then look for the law by discovering the "greatest common-factor." By the same method we can surely find the "greatest common factor of humanity."

One factor which distinguishes man from other animal life is the property of thought. This property is common to all human beings, irrespective of race, nationality, creed or doctrine. It is the means by which all our science and progress has been achieved. Without the power of thought man would be no better than the beasts of the earth. On the other hand it is the same power which has made possible the vast wars and social upheavals.

Thought therefore is a common factor and a starting point for the science of humanity. Like the other factors which we have discovered and applied, its results are good or bad, constructive or destructive, according as it is used in harmony with or in opposition to the law.

We are able to realise now that thought has been the prime factor in our inventive progress, and we can readily see that its misapplication is the cause of most of our failures; for all the doctrines and theories, isms and schisms which produce war and terror are manifestations of thought. So long as man remains in ignorance of the Science of Humanity, will he suffer the results of ignorance and misapplication of the laws of his existence. But there is great hope for the future in the knowledge that man has the power of discovering and applying the laws of nature, and in the fact that a small beginning has already been made by scientific men.

Whether that progress is to be hastened or retarded, whether it is to be achieved through darkness and tears or through sunshine and joy, depends upon our discovery and application of the laws underlying the science of humanity.

Sir Francis Bacon wrote that "the last or furtherest end of knowledge is the glory

of the Creator and the relief of man's estate."

René Descartes, the founder of modern mathematics, who lived in the seventeenth century, wrote: "There is nothing so far removed from us as to be beyond our reach provided only that we abstain from accepting the false for the true and always preserve in our thoughts the order necessary for the deduction of one truth from another."

Among those who, in the language of to-day, are known as scientists we discern a tendency to explore beyond the region of so-called physical science. The names of Sir William Crookes and Sir Oliver Lodge may be mentioned in this connection. Professor J. A. Fleming, well known as an electrical scientist and by his work in connection with wireless communication, suggested seventeen years ago that "in its ultimate essence energy may be incompre-

hensible to us except as an exhibition of the direct operation of that which we call mind and will."

Even in the medical profession the power of thought is gaining recognition. The effects of imagination and the partial success of psychology and hypnotism are receiving consideration, while, in France, two scientific medical schools have been founded on what is termed psycho-therapeutics (mental healing).

Such work, however, need not be limited to the savants, every intelligent person can study the science of humanity in himself and his surroundings, and thus assist in the march toward the true millennium.

The long history of human life, in spite of the failures and terrors which fill its records, indicates a fundamental law of progress. If progress is a law of nature it must be, like other natural laws, infinite and further human progress is assured.

SHORTENING THE EQUATOR

Epecially Written for "Sea, Land and Air" by SPARR KERR.

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Jules Verne once set the standard for the circling of the Earth,
He showed how it was done in eighty days;

He called up lots of ridicule and started founts of mirth,
But some he filled with wonder and amaze.

And as the world grew older and inventions came apace,
The eighty days no longer set the mark,
For rival steamship companies and trains were wont to race,
And speed was kept the same in light and dark.

And lower, ever lower, crept the mark each record set—
It recently was down to thirty-five—
But now an age is on us and to make it lower yet,
The speedy circumnavigators strive.

The aeroplane's within its own, in safety, speed and size,

It's going to short the line around the Earth;

Oh! shades of Verne the Wonder, who wrote prophecies, not lies,

Rise up and gaze upon your mighty worth!

Your dreams evolved a monster that would soar and sail through space,
And yet its weight would far outweigh the air;

You also set a standard by your memorable race;

Your records now are set up to compare.

There are some who set the figure at a paltry seven days,

And some, a bit more sober, aim at ten;
But to follow the Equator in just twenty would amaze;

It's bound to come to pass—we wonder when.

And these are the objectives of man, but in the flesh,

Endavouring to lower Jules Verne's mark.

But wait, eight times a second, right around and finish fresh,

Oh yes it can—the singing wireless-spark.

AUSTRALIA'S FIRST AEROPLANE AUCTION

(From our Melbourne Correspondent.)

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At the Central Flying School, Point Cook, Victoria, on Wednesday, March 19, the first auction sale of aeroplanes in Australia was opened at 11 a.m. by Messrs. Charles Forrester & Co., of 15 Queen Street, Melbourne, acting under instructions from the District Contract and Supply Board of the Department of Defence.

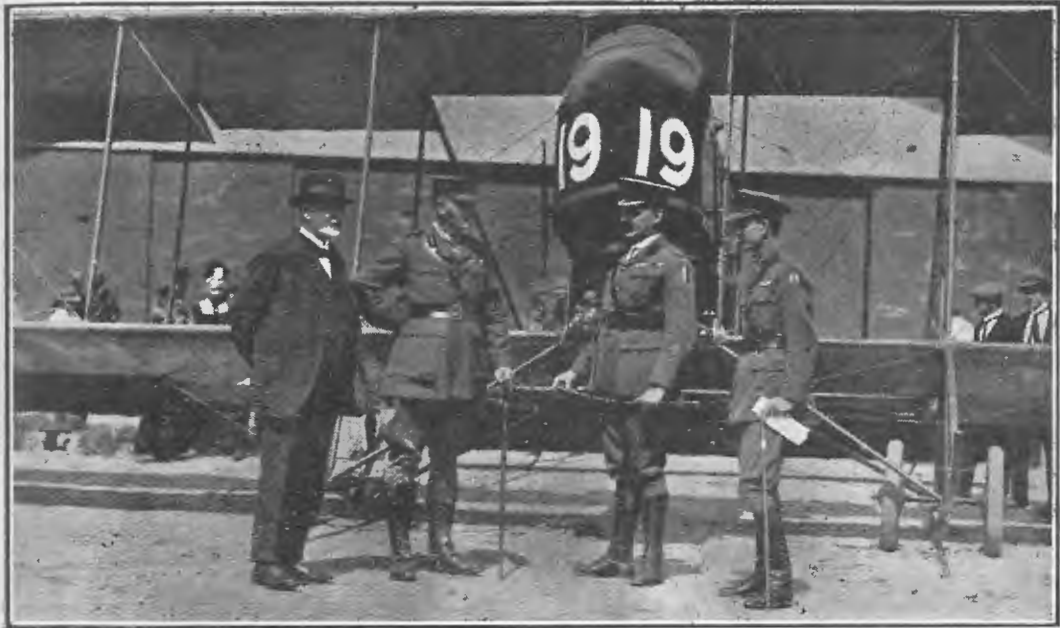
The following were catalogued for sale:—

Among other conditions of sale it was announced that:—

These machines are not guaranteed further than that they have been inspected and tested by one hour's flight before being offered for sale. This is the customary guarantee. They will be flown at the sale.

Purchasers will be required to take delivery at Central Flying School within fourteen days after sale.

Packing cases can be provided and machines packed, if desired, at cost price.



THE AEROPLANE AUCTION AT POINT COOK.

Left to right: Mr. C. Forrester, Auctioneer; Major-General J. Gordon Legge, C.M.G., C.B., Chief of Commonwealth General Staff; Colonel Cass, Director of Military Art; Major W. Sheldon, A.F.C., Commanding the Central Flying School.

Four Maurice Farman Aeroplanes (complete with engines and spares).

Two De Havilland-6 Aeroplanes (complete with engines).

One 80 h.p. Renault Engine.

Four 70 h.p. Renault Engines.

One 35 h.p. Anzani Engine.

One 50 h.p. Gnome Engine.

Two 50 h.p. Le Rhône Engines.

Together with spares.

Any flying of machines by Defence Department pilots after sale will be at purchasers' own risk and expense.

Repairs to any of the machines will be undertaken by the Defence Department at the Central Flying School at cost price, plus ten per cent. for a period of 12 months from date of purchase, if available from stock.

Spare parts for the De Havilland-6 machines will be supplied at cost plus ten per cent., for a period of 12 months from date of purchase of machine, if available from stock.

The Flying Schools are situated some three or four miles from Laverton station, and the latter some twenty miles from Melbourne; consequently the attendance was by no means large, and it is estimated that nine out of every ten persons present had been attracted more by curiosity to see the machines make their exhibition flights than from any serious intention of purchasing—or even bidding for—them.

The eight aeroplanes to be auctioned were lined up for inspection outside one of the hangars, and three of them made short ascents to demonstrate their airworthiness.

The first to come under the hammer was one of the D.H.-6's. The auctioneer, Mr. C. Forrester, in putting it up, explained that the machine would carry two persons, with light baggage, for two hours, on the basis of its existing petrol capacity, that its speed was 60-65 m.p.h., and its original cost £1,800. The aeroplane was now taken up and after reaching an altitude of about 1,000 feet, made a capital landing almost exactly at the point of ascent.

"What am I offered?" asked Mr. Forrester, but not a solitary bid was forthcoming.

The next lot was a Maurice Farman Shorthorn (popularly known in aviation circles as the "Rumpety"). This machine had cost £1,500, and elicited a sporting offer of £250; no further bids being received the "Rumpety" was withdrawn from sale.

In the circumstances it was obviously sheer waste of time to offer the remaining six machines listed on the catalogue, and a move was now made to the building in which the engines and spare parts were to be auctioned.

A single bid of £70 for a Renault engine, originally costing £650, was refused.

The Anzani engine was finally submitted, with the announcement that it was worth at least £150 second-hand. For this three bids were made and, at £25, passed into the possession of Master Wilfred Brookes, the thirteen-year-old son of Mr. Herbert Brookes, managing director of the Australian paper mills. This budding aeronaut is said to have already constructed two gliders with which he has successfully experimented at Kew; he proposes to instal his new purchase in a small two-seater seaplane which he is now building.

With this single transaction the proceedings were now brought to a close. Subsequently the two D.H.-6's were purchased privately by Aerial Company Limited, a newly-formed Sydney enterprise, while similarly the four "Rumpetys" were acquired by Messrs. R. Graham Carey—a motor engineer and pioneer airman, well-known in Victoria—and by Mr. A. Fenton, Mayor of Essendon. These two gentlemen are now conducting pleasure flights in Victoria while, in the case of Aerial Company Limited, similar operations will be conducted in New South Wales.

AERIAL ACTIVITY IN AUSTRALIA

NEW COMPANIES REGISTERED

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Registration under the Companies Act has been granted to Aerial Company Limited (Sydney, April 16, 1919) and to Aerial Transport Limited (Melbourne, April 12th, 1919).

Aerial Company Limited, which has adopted the shorter title A.C.L., is capitalised at £20,000, in £1 shares, issued as under:—

5,000 Contributing shares, payable 5s. on application, 5s. on allotment and balance in monthly calls not exceeding 2s. 6d.

4,000 fully paid shares, to be issued to vendors.

11,000 in reserve.

The new Company's headquarters are at 14 Martin Place, Sydney; its solicitors

Minter Simpson & Co.; secretary, Mr. W. J. Drummond, A.C.I.S.; auditor, Mr. H. F. Helder, F.I.I.A., and its bank, the National Bank of Australasia, Limited.

Its objects, as detailed in the Company's prospectus, are:—

- (1) To purchase outright, for cash, two suitable aeroplanes and necessary spare parts;
- (2) To secure a leasehold of suitable landing ground for an aerodrome;

(5) To secure agencies abroad for the purpose of marketing the most up-to-date aeroplanes and accessories.

(6) To establish branches in country centres.

The whole of the capital has been subscribed privately and all preliminary expenses borne by the Company.

The undermentioned directors and office-bearers have been appointed:—



The owners take delivery of their first D.H.-6 aeroplane at Victoria Park Racecourse, Sydney, April 8, 1919.

Reading from left to right.—Mr. V. B. Madden (Vacuum Oil Co., Pty., Ltd.), Mr. J. A. G. Hadley, Capt. H. G. Watson, A.F.C., Mr. W. J. Drummond, Mr. G. P. Mann, Mr. H. C. Macfie (Chairman of Directors), Mr. R. Thomas, Lieut.-Col. P. W. Woods, D.S.O., M.C., Captain P. G. Taylor, M.C., R.A.F., Lieut. N. P. H. Neal, M.C., M.M. (Director of Publicity), Capt. J. H. Matthews, Cap. J. G. Bolton, Lieut. R. F. Oakes, A.F.C., Mr. P. T. Taylor, M.H.R.

(3) To promote an interest in aviation and any purpose to which the aeroplane may lend itself, such as pleasure flights, commercial, advertising and exhibition flights and aerobatics.

(4) To establish an instructional school in aviation, to be conducted, at a reasonable fee, on lines similar to the military aviation school at Hendon, near London;

Lieutenant-Colonel Percy William Woods, D.S.O. (and bar), M.C., Managing Director.

Captain H. Gilles Watson, D.F.C.

Captain John Hamilton Matthews.

Lieutenant Norman Percy Harold Neal, M.C. (and bar), M.M., Director of Publicity.

Mr. (ex-Sergeant-Major) George Peattie Mann.

Mr. Lebbeus Horden.

Mr. H. C. Macfie, F.C.P.A., F.C.I.S. Chairman of Directors.

Particular interest attaches to the military records of the five first-named directors, all of whom embarked in 1914 with the first A.I.F. contingent.

Colonel Woods enlisted as a private in the 3rd Battalion, won his commission in May, 1915, at Gallipoli, and remained in the field with never a day's absence from his unit until his return to Sydney in the *Durham* on Christmas Eve, 1918.

Captain Watson served throughout the Gallipoli campaign with the 2nd Signalling Troop; he then transferred into the crack battle-squadron (No. 4) of the Australian Flying Corps, in which he rose to the rank of Flight-Commander. Captain Watson, who is a resident of Newcastle, brings back the Distinguished Flying Cross and a record of having brought down seventeen German aeroplanes.

Captain Matthews who, like Colonel Woods, sailed with the original 3rd Battalion, fell, with fourteen wounds, into enemy hands at Fleurbaix on July 19, 1916, returning to Sydney in the *Orontes* on February 4th of the present year, after having experienced prison life in the following camps: Hamelburg, Rosenberg, Crefeld, Strohen, Heidelberg, and finally, Montreux, in Switzerland.

Lieutenant Neal and Sergeant-Major Mann enlisted together as sappers in the 1st Signal Company. Lieutenant Neal received his corporal's stripes on Gallipoli, was promoted to the rank of sergeant in Egypt, and won his commission in April, 1917, at Bapaume. Sergeant-Major Mann returned to Sydney in the *Devon* with the first Anzac furlough men.

Yet another military member is Flight-Commander C. M. Chateau, R.A.F., who with Colonel Woods, recently purchased on the Company's behalf the two D.H.-6 aeroplanes offered for sale at Point Cook by the Department of Defence.

The story of how these machines were subsequently flown from the Central Flying School to Sydney has been told many times and in many ways, but in no case has full credit been given to the enterprising airmen who conducted the flight nor has the general public yet been made aware of the many difficulties and obstacles encountered *en route* and successfully overcome.

Before attempting to present the cir-

cumstances in their proper sequence it should be explained that this particular type of aeroplane was never intended for long, cross-country flights, a fact made abundantly clear, first, by the catalogue issued at the auction sale and, secondly, by an official explanation as to how and why the D.H.-6 was designed.

In the sale catalogue the machines are listed as under:—

Lot No. 5.

De Havilland-6 Machine, No. B. 2802.—This is a practically new machine, of solid construction. Has flown 18 hours, 11 minutes. Is capable of carrying two people for a duration of two hours. Is well suited to tuition and robust enough to stand landing on bad country.

Lot No. 6.

De Havilland-6 Machine, No. B. 2803.—This is a sister to the above, is in equally good condition, and has flown for 29 hours 54 minutes.

Consider next the description recently published in London by the official journal of the Royal Aero Club of the United Kingdom:—

The D.H.-6 Towards the end of 1917 the question of training pilots became pressing, and the need for a machine designed especially for school work became apparent. To meet this demand the D.H.-6 was designed by Captain Geoffrey de Havilland, R.A.F. The objects kept in view were: Simplicity—and, therefore, ease of manufacture, maintenance and repair; interchangeability of parts; low landing and stalling speeds. Hence the straight tips and control surfaces. The flat and ordinary vertical nose of the fuselage might be thought to offer unnecessary resistance, but it should be remembered that the D.H.-6 is a school machine, and that this detrimental surface was intended to safeguard the machine against being dived at too high a speed by inexperienced pupils. For the same reason plain cables are used in the wing bracing. An ingenious quick-release dual system of control is fitted, by means of which the instructor can by the movement of a single lever, completely cut out the pupil; this quick-release includes, not only aileron and elevator, but also rudder control.

A remarkable feature of the D.H.-6 is the low speed at which it can be flown. The standard machine has a main speed of 75 m.p.h., and lands at about 30 m.p.h., while it may be actually flown at 30 m.p.h. It is intentionally made slightly unstable for the purpose of teaching, but a few slight modifications will convert it into a stable machine. By fitting streamline wires instead of the wing bracing cables and by cowling-in the engine the maximum can be increased to 90 m.p.h. In this form the machine should be very well suited to pleasure flying, especially as it was primarily designed for cheapness of manufacture.

Here, then, we have a type of aero-

plane expressly designed for elementary instructional purposes, and—as a peacetime alternative—for short pleasure flights; a distinctly fool-proof machine, heavy as a motor lorry, steady as a rock and safe as the proverbial church. Not by any stretch of imagination can the D.H.-6 be regarded as a record breaker, and a lengthy cross-country flight could be accomplished only in a series of short "hops," with descents every two hours for petrol:

pletion of certain final arrangements, Commander Chateau has been made an honorary member of the mess. A similar courtesy was extended some months ago to the present writer, and the picture of the group of flying officers assembled at that festive board will long remain clear. We may conceive Commander Chateau among a merry party, which would probably include Captains McNamara, V.C., Taylor, M.C., Tregilles and Geere; Flight-Lieutenants Oakes, Miller, Tun-



Flight-Commander C. M. Chateau, R.A.F., Aerodrome
Manager to Aerial Company Limited.

To appreciate the events which led to the undertaking of the Melbourne-Sydney flight in machines of this type, the reader should imagine himself in the officers' mess at the Central Flying School during the luncheon hour on a certain afternoon towards the latter end of March.

The purchase of the aeroplanes has been concluded and, while awaiting the com-

bridge, and perhaps half-a-dozen others.

The instructional staff is composed exclusively of officers whose wings and other decorations have been won on active service overseas; heroes of a hundred aerial encounters above the German lines, five or six miles "up," in modern single-seater "do-or-die" busses; men for whom the term "air-risk" is without meaning,

and who—if the truth be told—find the conditions at Point Cook comparatively tame; “sedentary employment,” they term it. Thus, any diversion from the dull routine of teaching youthful cadets to fly around an aerodrome in a non-cap-sizable machine, is particularly welcome down at the “aerodrome in the wilderness.”

The conversation on this particular day has turned on the question of conveying the two D.H.-6's to their destination. We may imagine Commander Chateau explaining to the mess that the cost of transporting his company's purchases to Sydney, whether by rail or by steamer, would approximate £300. We may imagine, too, the brain-wave suddenly developed by one of his companions and expounded in words to this effect: “Tell you what, Chateau; if you can get the Major's permission, we'll flip your busses up to Sydney for you and save your people the freight.” That is probably how and where the idea originated, for readers of this journal will recall that the Melbourne-Sydney aerial route was surveyed and mapped out, during the early part of the present year, by two officers of the Point Cook instructional staff; incidentally it may be noted that one of those officers has his home in Sydney, and that there may have been visions of special leave in the metropolis after delivering the goods.

The necessary permission was duly granted, the machines given a final overhaul, and arrangements made for refuelling at various points of descent along the route. Given favourable weather conditions there was no apparent reason why the journey should not be completed in four or five two-hour “hops.”

But right from the very start the adventurous quartette was dogged by the worst possible luck. Their position was further aggravated by the announcement by certain sections of the Press, that the party would make a non-stop flight to Sydney; an achievement, which, on a D.H.-6, is absolutely impossible.

On March 31st, the Melbourne correspondent of *Sea, Land and Air* telegraphed advising the departure of the two machines from Point Cook at 10.35 a.m., and of their descent two hours later at Benalla, 141 miles distant.

The following morning's mail brought from the Sydney office of the owners, an invitation to the writer to witness the landing, at Victoria Park Racecourse, of the Company's “Aerial Fleet,” which was expected to arrive that afternoon at 3 o'clock. As a matter of fact the first machine did not reach Sydney until seven days after that date, and the second a week later than the first.

The various circumstances which occasioned these delays, together with the many difficulties encountered by the party, have been narrated and illustrated by Flight-Lieutenant Oakes, A.F.C., who piloted one of the machines across, and who, be it noted, was one of the original Melbourne-Sydney aerial survey party previously referred to. This officer's contribution to *Sea, Land and Air* appears on page 77, and requires little or no additional comment by the present writer. To disparage the flight and to hold up to public ridicule the length of time occupied would be a simple matter—for those who have not troubled to ascertain the whys and wherefores. As a matter of fact the actual flying time, in the case of the first machine, was 9½ hours, and in reviewing the situation it should be borne in mind that it had been decided, before leaving Melbourne, that there should be no attempt at making a speedy flight. The owners' chief concern was to avoid anything which might endanger human life, cause damage to private property or tend to weaken public confidence in the *safety* of the machines.

It should be added that the party carried a totally inadequate tool kit, with no spares of any description, and that all repairs during the journey had to be effected under mechanical conditions even more disadvantageous than would apply in active service flying—although, of course, the risk was considerably less.

The first machine, No. B. 2802, manned by Captain P. G. Taylor, M.C., R.A.F., and Flight-Lieutenant R. F. Oakes, A.F.C., came into view above Victoria Park at 4.24 p.m. on April 8th, and 17 minutes later made a faultless descent on the racecourse some ten or twelve yards beyond the landing T.

At the New South Wales State Aviation School, Richmond, an exhaustive examination of the aeroplane showed that

a moth had found its way into the petrol lead junction pipe, the aperture of which is barely three-sixteenths of an inch in diameter; a block was thus created, with the result that the petrol was prevented from reaching the carburettor of the engine.

The flight was made on "Plume" benzine and Gargoyle Mobiloil, supplied by The Vacuum Oil Co., Pty., Ltd.

The machines will be utilised for non-stop pleasure flights to districts anywhere within a two-hours' air radius of Sydney, full particulars of which are obtainable at the Company's offices. They will be piloted by two ex-officers of the Australian Flying Corps, returned from active service overseas. Both are "1914" men, one being Lieutenant Clement V. Ryrie (late No. 4 Squadron), who returned to Sydney in the *Orontes* three months ago, and is a nephew of Brigadier-General G. de L. Ryrie, K.C.B., C.M.G.; the second A.C.L. pilot is Lieutenant A. H. Fitton, who, although nominally a member of the Australian Flying Corps, has served chiefly with the Royal Air Force, operating against enemy submarines in the North Sea.

The position of aerodrome manager has been accepted by Flight-Commander Chateau, who left Australia in 1914 as a private in the 2nd Battalion, was promoted on Gallipoli to the rank of sergeant, and evacuated, wounded, to England, where he transferred into the Royal Air Force. This officer is the son of Mr. C. W. M. Chateau, proprietor of the Grosvenor Hotel, Sydney.

AERIAL TRANSPORT LIMITED.

Registration under the above title has been granted to a company recently formed for the purpose of putting into operation the plans and projects of Major Lee Murray, R.A.F., and Mr. H. Sleeman.

Major Murray's proposals were fully detailed in the February (1919) issue of *Sea, Land and Air*, which it may be added, enjoyed the distinction of making the first public announcement of this ambitious undertaking.

Early during the year an application was lodged with the Government for the registration, not only of Major Murray's company, but of a second, and somewhat

similar enterprise for the aerial transport of passengers, merchandise and mails between the capital cities of the various States of the Commonwealth.

The first of these two schemes was advanced by Mr. H. J. Sleeman who, for eighteen months, held the positions of Assistant Instructor in Flying and Officer Commanding the Technical Branch at the Central Flying School, Point Cook.

The second project was that of Major Murray, who has had considerable flying experience overseas, and who returned to Melbourne in August last, under appointment to the Commonwealth Government. Eventually the two projects were amalgamated under the title Aerial Transport Limited, and permission for the registration of the Company was granted by the Treasury officials on April 12th.

The new enterprise is backed by some of Australia's leading financial and business men, and we are informed that the preliminary work has already been commenced, and that the actual flying services will be introduced immediately upon completion of these essential preliminaries which will consist of:—Surveying the various inter-State routes over which the services will be conducted; arranging for aerodrome sites; obtaining and tabulating meteorological information; investigating the possibilities of local manufacture of aircraft and aero-engines, and deciding upon the types of machines and engines most suitable for the conditions under which they will be required to operate in Australia.

This aerial transport service will undoubtedly do much to bring us into line with other countries already running similar services; it will help to keep our State capitals in closer touch with each other, besides which it will unite these capitals with their outlying districts, open up the interior of the continent, and provide quick transport for perishable commodities, samples, and such light, portable articles as cinematograph films, jewellery, furs, etc. Further, it is confidently predicted that inter-State mails will eventually be carried by this Company.

Another noteworthy fact is that the capital, which is divided among all the States of the Commonwealth, will be held

and controlled by persons of British birth, and the entire staff of Aerial Transport Limited will be comprised of British-born subjects.

The Company is prepared to assist in the defence of the country by placing its aerodromes at the unrestricted disposal of Government pilots. A proposal is now before the Government for the training, by this Company, of a large number of Commonwealth Air Force pilots, instructing them in the practical flying and aerial navigation of large machines, and throwing open its workshops for the purpose of initiating them into the details of aircraft construction.

Further, should the necessity ever arise, the whole of the Company's organisation, both personnel and equipment, would be placed, without reserve, at the country's service. On conclusion of the preliminary arrangements the Company expects to be able, at twenty-four hours' notice, to put into the field two complete flying squadrons, automatically increasing this number as the scope of the services widens.

Passengers by the proposed aerial services, will, it is claimed, travel in one-third of the time now occupied by the railway systems, and in greater comfort. The machines will be entirely closed in and, during the cold seasons, artificially heated. Wind, vibration and unsteadiness will be avoided, and the engines rendered practically noiseless, thereby premitting reading and writing both by day and by night. As only a limited number of passengers will be carried, there will be no overcrowding.

Each aeroplane will be fitted with a wireless installation, and passengers may send and receive messages throughout the trip. It is probable that, at a later date, arrangements will be made for the publication of a wireless bulletin for circulation among the Company's aerial travellers. Light refreshments will be served on board.

Aerodromes will be laid out in close proximity to the cities of Brisbane, Sydney, Melbourne, Adelaide, Perth, Launceston and Hobart, and taxis will be in attendance at the terminals to meet incoming machines.

The aeroplanes will be of the latest design, of British manufacture, and equipped with four engines, on any two of which the machine can be flown at normal speed.

The possibility of forced landings will be very remote and, to further guard against this, intermediate aerodromes will be provided at convenient distances along the various routes, so that should the necessity for a forced landing arise, it can be made on specially prepared ground.

The progress of the design and construction of aircraft has been such of recent years that the risk of accident at the present time, apart from war risks, is no greater than that entailed in travelling by steamship, railroad or motor car. It is interesting to recall that the Australian Mutual Provident Society has, in a * letter from the managing director to the editor of *Sea, Land and Air*, officially stated that in the event of an aerial passenger service being established, life risk of passengers in aircraft will be covered by ordinary life insurance policies, without additional premium.

The average passenger fare between capital cities will be less than £6 per head per single trip. The services will be developed in two stages, the first stage consisting of one daily service each way between Melbourne-Sydney in 6½ hours direct; Melbourne-Adelaide in 5½ hours direct; Melbourne-Hobart in 7½ hours (landing at King Island and Launceston).

The second stage will comprise an extension of the daily service each way between Sydney-Brisbane in 6½ hours direct; Sydney-Adelaide in 11 hours (landing at Hay), Melbourne-Broken Hill in 7 hours (landing at Hay); Adelaide-Kalgoorlie-Perth in 18 hours. Other services will be developed in the various States, operating from capital cities and country towns.

For the Melbourne-Sydney, Melbourne-Adelaide services it is proposed that the trips shall be made at first during day, but later they will be made either during the day or night. The hour of departure from each terminal city is a point that will be decided by the requirements of the business community.

* February issue, page 688.

The machines which it is proposed to employ will have a capacity, in addition to their full load of fuel, crew, etc., of 3½ tons, which may be varied as follows:—

- (a) 30 passengers, allowing 25-30 lbs. of baggage per passenger;
- (b) 12 passengers and 2 tons of freight or mail;
- (c) 3½ tons of freight or mail.

Freight would be carried at the rate of 8d. per lb. and, if notified, the Company would arrange for its collection and delivery from door to door, provided the sender and receiver are within two miles radius of the G.P.O. of the capital city.

It is hoped that when the Company has proved its ability to operate an efficient service, mails will be carried in conjunction with the P.M.G.'s Department, and it is suggested that letters intended for quick transport will be charged at the additional rate of ½d per oz. The envelope should be clearly marked "Aerial

Mail." These letters could be posted in any pillar box within the city radius of the capital of the various States. They would be collected in the ordinary way, conveyed to the aerodrome, carried to their destination by air, and delivered at their address in the same manner as letters carried by train or boat.

During a recent interview in Melbourne the promoters of Aerial Transport Limited assured the present writer that no difficulty will be experienced in maintaining the service to its time schedules, as the climatic conditions in Australia are excellent for services of this description, and, in addition the machines which it is proposed to use, will be equipped with a big surplus of engine power and with the latest scientific apparatus for direction finding. Further, the Company's meteorological department will be continuously obtaining and tabulating weather information so that instead of winds proving a hindrance, they will be made to assist.

FROM MELBOURNE TO SYDNEY IN A D.H.-6

Especially Written for "Sea, Land and Air" by
FLIGHT-LIEUTENANT R. F. OAKES, A.F.C.
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Editorial Note.—Lieutenant Oakes is a member of the instructional staff at the Central Flying School, an appointment which he took up some six months ago on his return to Melbourne after considerable active service with the Australian Flying Corps in France.

A Sydney company having purchased two De Havilland-6 aeroplanes from the Defence Department in Melbourne, it was decided by the owners that the machines should be flown to Sydney. Two pilots from the Central Flying School, Point Cook, Victoria, were detailed to conduct the flight. One of these was Captain Patrick Gordon Taylor, M.C., R.A.F.—son of Mr. P. T. Taylor, M.H.R., of Sydney—who, for several years has served in France with the Royal Air Force, and who has been lent to the Australian Defence Department as an instructor in war-flying. Of this officer the London *Military Gazette*, in June, 1916, published the following:—

He has taken part in over 40 offensive patrols at low altitudes and under heavy

fire from the ground. He has always shown exceptional dash and gallantry in attacking large formations of hostile machines, setting a very fine example to all his comrades.

The second officer detailed for the inter-State flight was the present writer, while Flight-Sergeant Schneider, A.F.C., an expert mechanic, also newly returned from overseas, accompanied Captain Taylor, and proved invaluable during the flight.

My passenger was Flight-Commander C. M. Chateau, R.A.F., Melbourne representative of the Sydney company.

Lieutenant Chateau must be admired for his keenness, for it is perhaps the most nerve racking thing for an experienced aviator to fly as a passenger, to realise what is going on, and yet have no control over the machine.

Sunday, 30th March, was decided on as the date of departure. The Commanding Officer and various members of the Aeroplane Repair Section at the Central Flying School worked hard throughout Saturday night in tuning up the two machines in order to obviate as far as possible any chance of mechanical failure during the trip. When we arrived down at the hangars at daybreak on Sunday morning the machines were standing outside ready and waiting.

Before describing the actual flight it would be well to fully understand the

therefore a machine eminently suitable for short, comfortable flights round an aerodrome, and the element of danger is cut down to a minimum. But for a long flight exceeding five hundred miles over extremely rough country, away from all mechanical assistance and with high mountains to cross, it is extremely unsuitable. Great difficulty was encountered at times in gaining sufficient height to cross ranges of mountains, and then the machine was so low that in the case of engine failure a radius of half a mile was the maximum gliding dis-



THE MELBOURNE-SYDNEY FLIGHT.

Captain P. G. Taylor, M.C., R.A.F. (left), and Lieutenant R. F. Oakes, A.F.C., with the D.H.-6 aeroplane in which they flew from Melbourne to Sydney.

Reproduced by courtesy of the Sun (Sydney).

type of aeroplane used, it will then be understood why so much delay occurred.

The De Havilland-6 aeroplane was designed for the War Office purely as an elementary instructional machine. Strength, safety, economy and the placing of the pilot and pupil close together in order to facilitate communication were the primary points considered in its design. In these points it was a success. Naturally speed, climb and reserve power had to be sacrificed to this end. It is

tance. The air speed is so small that, against a strong head wind, the ground speed is cut down to about 25 miles an hour and, as the petrol supply only lasts for two hours, a great distance cannot be flown without landing to fill up again.

The best machine for such a trip is one with a high speed, a quick climb and a supply of petrol sufficient to ensure at the most only one landing for the purpose of filling up. The D.H.-6 has none of these characteristics.

Unfortunately the first hitch occurred before the aeroplanes left the ground. The petrol tank in one of the machines was slightly damaged and would not hold the pressure required to force the petrol into the carburettor. This involved the fitting of a new tank, and a start could not be made until after breakfast.

When the machines finally left the ground there was a strong wind of about 25 miles per hour blowing from the north, yet the pilots counted on at least being able to reach Avenel before the petrol gave out. But, as is often the case, the wind strengthened considerably as the height increased, and at the end of twenty-five minutes, at a height of 2,500 feet, the machines had travelled a total distance of only four miles. The wind was blowing at practically 60 miles an hour and it was necessary to hold the machines well down to prevent them from drifting backwards over the bay. So the

to Benalla, the first stopping place, it continued steadily, forcing us lower and lower to keep under the clouds. From Avenel to Benalla we were flying at an average height of 250 feet.

Benalla was reached within 1 hour 40 minutes of our departure from the Central Flying School; a distance of 141 miles. A safe landing was made in the Poker Paddock, and in spite of the heavy rain a crowd soon collected to see, in many cases for the first time, a flying machine. Oil and petrol were on the ground almost immediately, and after covering the machines with tarpaulin borrowed from the railway staff, we were driven into town for lunch.

At 3.30 p.m. the weather having cleared up, we prepared to depart, but unfortunately the engine on the writer's machine was not going well, some water having got into the carburettor. An hour was spent in



THE MELBOURNE-SYDNEY FLIGHT.

A descent at Cootamundra.

attempt was abandoned and the aeroplanes crabbed sideways back to the aerodrome, where they were stowed away.

About midday the wind suddenly dropped, then changed round to a strong southerly. Heavy rain, however, prevented the machines from leaving.

The start proper was made shortly before 11 o'clock on Monday morning, March 31st, with a good southerly wind behind. All went well as far as Wallan, good country being passed over, and no trouble occurring with the clouds. On leaving Wallan an extensive and wild range of mountains is encountered. The country here is absolutely impossible for landing on, and between Wallan and Seymour is as bad as any on the whole route.

As the machines approached Seymour rain commenced to fall, and from there

remedying this, the machine was then taken up for a short test flight. Two minutes after leaving the ground the engine started to miss and splutter and much difficulty was experienced in getting safely back to the landing ground. It was then decided to overhaul the engine and resume our journey in the morning. The work was done by Flight-Sergeant Schneider, and on Tuesday morning, April 1st, everything was again in satisfactory working order.

The wind was slightly head on, but a good flight was made to Albury in 1 hour 30 minutes. As the occupants of the machines were then feeling fairly hungry it was decided to descend for lunch. A landing was attempted on the racecourse, but as this was covered with sheep, a small field nearby was used. A crowd

soon assembled, but after a fill up with petrol and oil the machines set out immediately after lunch for Wagga. The flight to this town was accomplished in the cool of the afternoon, and occupied about 1 hour 30 minutes. The air was far less bumpy than at midday, and the conditions were most enjoyable.

A landing was effected on the racecourse at Wagga, about five minutes' walk from the town, and in a very few minutes several hundred people—mostly children—were surging round the aeroplanes. One bright youth hit on the idea of autographing the rudder, and soon every imaginable name, from Bill Smith

the tail plane or walking along the wings.

We were entertained that evening at the local picture show by the Mayor of Wagga, and afterwards at his home.

In the morning several inhabitants, including the Mayor, were taken for short flights in appreciation of the welcome which had been extended, and soon after 11 a.m. a start was made for Cootamundra. Shortly after taking off, however, the writer's engine again began to miss badly, and we just managed to struggle back to the racecourse. Repairs were effected, and immediately after lunch on Wednesday, April 2nd, a fresh start was made with more success.



THE MELBOURNE-SYDNEY FLIGHT.

Bad "landing" country between Goulburn and Moss Vale.

to Horace de Gillespie, was written on every available space on the planes, tail plane and rudder. The number increased each moment until Lieutenant Chateau despaired of ever flying the machines again, but after they were covered up and the public informed that no further flight would be attempted until the morning the crowd dispersed and no damage was done. It is hard for the average small boy to realise the general fragility of a flying machine, and his one desire is to have the honour of sitting on

All went well until a few miles beyond Junee, when the same engine stopped altogether, the machine then being at a height of 800 feet. Luckily a good pad-dock was within gliding distance, and both machines landed safely. It was then decided to thoroughly overhaul the carburettor and ignition of the faulty engine. This was a long job, and we were compelled to spend the night at Junee.

In the morning (April 3rd) the wind was slightly head on, but Cootamundra was reached after a flight of about 1

hour 20 minutes from Wagga. On landing at Cootamundra the propeller of the machine which had been giving the previous trouble was found to be badly chipped; so badly that it was unsafe to proceed until a new one had been fitted. The wire rod which secures the engine cowling had vibrated forward and caused the damage. An urgent wire was despatched at once to the Central Flying School for a new propeller, but notice came through that it could not arrive before Saturday morning. This was most disastrous, but we thoroughly enjoyed our enforced stay in Cootamundra; several of the inhabitants were extremely hospitable and entertained us in the best possible manner.

and, before it would be possible to continue the trip, the engine would have to be taken down and thoroughly overhauled. Loss of compression due to the piston rings was the only explanation possible with the restricted means at the mechanic's disposal.

On Sunday, April 6, Captain Taylor and the writer decided to continue the journey together in the other machine, and accordingly made a start immediately after lunch.

After about 45 minutes flying Yass was reached, and trouble was again experienced owing to the throttle controls coming adrift. It was necessary to land and adjust this, and on starting off again a successful flight was made to Goulburn



THE MELBOURNE-SYDNEY FLIGHT.

Photograph—taken *en route* by the author—of Captain P. G. Taylor's aeroplane.

During the few days spent at Cootamundra some enthusiasts were taken for short flights and were highly delighted with the new experience.

The machines were to leave Cootamundra on Saturday morning, April 5th, but the same engine started to give trouble again, and Sergeant Schneider worked hard on it all that day and for some time on Sunday morning. Running at its best it would not give sufficient revolutions

in 45 minutes, where a stop was made just as it commenced to rain.

Goulburn was left on Monday morning, April 7th, at about 11.35 and, although the engine was missing slightly, it was a very pleasant flight to Moss Vale where the machine landed 40 minutes later at the Bong Bong racecourse to fill up with oil. Unfortunately, more trouble cropped up here. The carburettor had to be completely overhauled and the night spent at

Burradoo, where the aviators were again very warmly welcomed.

On Tuesday morning, April 8th, the engine was tuned up as far as possible under the difficult conditions and, although not giving the requisite amount of revolutions, a start for Sydney was made at 3.10 p.m. After an extremely successful trip Broken Bay, Sydney and then the Harbour were sighted, to our very great satisfaction, as we were feeling the strain of the continual struggle against the difficulties of the unsuitable machine and the bad weather conditions.

A good landing was made at 4.45 p.m. on Victoria Park Racecourse, which was easily recognisable from the map, and also because of a smudge fire and a landing **T** put out by the owners of the machine.

The aviators were warmly welcomed on landing, and after an agonising five minutes of being photographed for the Press, we were able to get away to our friends.

The total flying time on the flight was 9 hours 45 minutes.

Description of the Route.

The route taken on the flight was the same as that of the Melbourne to Sydney railway, for two reasons. The railway formed the best guide and it went through the best country. Flying at a low height, a slow machine with a limited capacity must have some definite line to follow on a long flight like this. A machine with speed, climb and large petrol supply could make a more direct flight and cut down the flying time considerably.

The country passed over may be divided into three classes: (1) suitable for landing; (2) suitable for landing in places, and (3) entirely unsuitable for landing. The third class increases as the height and gliding distance of the machine decrease, and *vice versa*. With a D.H.-6 there is a large amount of this third-class ground, but with a fast machine it would be practically eliminated.

The route as surveyed by car was found to be very suitable as far as the distance, apart from landing grounds and their surface, is concerned. After leaving the Central Flying School first-class country is passed over until Wallan is reached. The first landing ground is situated here, as high mountains are encountered immediately after leaving Wallan, and it is necessary to have somewhere to land in the event of the weather being too bad to cross them.

Leaving Wallan the country becomes very bad and, until Seymour is reached, it would be impossible to land an aeroplane anywhere. After Seymour it opens out a little and a very good landing ground at Avenel forms a welcome break in the bad country. Between Avenel and Benalla the ground appears fairly good in places, but is only second-class, as most of the seemingly open fields are in reality covered with stumps which would cause a certain crash on landing.

At Benalla there is a very fair landing ground close to the town. This is the first big town with a good landing ground and supplies of petrol and oil can be obtained if necessary.

Between Benalla and Albury the country can be graded as second-class, and in places, for short distances, as third-class. About three miles N.E. of Wangaratta there is a very excellent landing ground. The Murray River can be seen for twenty miles before reaching Albury, and the railway line abandoned as a land-mark if preferred. At Albury the racecourse is the best landing ground, but there are several smaller fields nearby which are quite suitable. Both here and at Wangaratta supplies of petrol and oil can be secured.

The country between Albury and Wagga is first-class, and is one of the best stages flown over. At Wagga the racecourse, about five minutes' walk from the town, forms an excellent landing ground, and all supplies can be obtained in the town. If a flight were to be made between the two capital cities with only one landing *en route* Wagga would be the best place to make the intermediate descent.

On leaving Wagga the country becomes second-class again, with one or two places such as the mountains round Bethungra, and just before entering Cootamundra, third-class. At Cootamundra, another large town, a big paddock on the outskirts forms a very excellent landing ground. Second-class country continues for a while after Cootamundra, with a landing ground on the racecourse at Harden, but for fifteen miles on either side of Yass it is bad. At Yass itself a good field is situated about two and a half miles south of the town. Before reaching Goulburn the Bredalbane Plains are encountered, consisting of perfectly flat country for about eight miles. At Goulburn there are several landing grounds, the one selected being about three miles along the Begonia Road.

From Goulburn to Moss Vale, if the railway line is closely followed, the country is second-class; a good landing ground at the Bong Bong racecourse is situated midway between Moss Vale and Bowral.

The country between Moss Vale and Picton is absolutely third-class, but after leaving Picton and until within ten miles of Sydney it can be described as first-class. The dense habitation around the city itself renders landing almost impossible, but such places as the Randwick racecourse, the Victoria Park racecourse, and the Rosehill racecourse are quite suitable.

* * * *

The Melbourne-Sydney route, if flown over in a long-distance machine, would be good, and in the case of a forced landing there are few places where it could not be made in comparative safety.

COMMONWEALTH SHIPBUILDING

THREE VESSELS LAUNCHED

Especially Written for "Sea, Land and Air"

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It is many years since far-sighted politicians and commercial men first suggested that shipbuilding in a large way would be a profitable industry for Australia. Then they were scoffed at as visionaries. To-day they are named as prophets.

The industry is, however, of very recent growth. Its birth really took place about the middle of last year, when, owing to the ruthless submarining of ships, water transport had become a serious problem to the whole world. It was left to Prime Minister Hughes, that inexhaustible reservoir of energy, to take the matter in hand in Australia.

Within six months his shipbuilding programme was approved by the Federal Government. The public almost expected to see stately vessels rising from the slips like mushrooms from the loam. But the real difficulties had only commenced and a policy had to be evolved that would charm the war-time administration and the various trades into harmony. When this was accomplished the dockyards in the various States were apportioned their quota of ships.

Amongst the conditions arranged with the unions was that the construction should be by piece-work. The men were guaranteed the minimum wage as determined by the Arbitration Court or Wages Board. An interesting light was, by the way, cast upon this question by the recent "go slow" scandal at Cockatoo.

During the Prime Minister's absence from Australia the Ministerial Administration of Ship Construction was undertaken by the Hon. A. J. Poynton, M.H.R. The chief executive officer in charge of the scheme, however, is Mr. H. W. Curchin, who gained his technical experience from the great "yards" of the world, *viz.*, Great Britain, America and Germany.

The Government Dockyard at Walsh Island, Newcastle, N.S.W., six years ago was merely a bank of mud

that had been flung up by the two branches of the Hunter River, entering the Newcastle Harbor. It was selected as a suitable site for a dockyard by the State Government, when the Commonwealth took over the Cockatoo Island Dock, Sydney, in 1913.

A wall was then built round the mud-flat that had for so long proved rather a nuisance to shipping, and sand was pumped in so as to form an island.

A mass of buildings were then erected under the direction of A. E. Cutler, Chief Engineer of the Public Works Department. There are five building slips, and two patent slips, the latter being capable of dealing with vessels up to 330 feet. Two cantilever cranes have a span of 101 feet 6 inches for a lift of 4 tons, and lift 6 tons at a span of 66 feet 6 inches. The pay-roll for the island contains 1500 names, and vessels up to a tonnage of 5500 can be handled.

It was this Walsh Island Dockyard that won the distinction of launching the first Australian cargo ship—the *Delungra*. The Naval Dockyard, Cockatoo, Sydney, came second with the *Biloela*, beating by a day only the *Dromana*, at Williamstown, Victoria.

The "Delungra."

The *Delungra* was launched on March 25 this year. She was six months and 19 days under construction,* her keel having been laid by the State Governor (Sir Walter Davidson) during the September rains.

The crowd at the launching was immense, and the scene a gay one and representative of all sections of the official and social life of the State.

The steamer *Newcastle*, gay with bunting, took the guests from the town wharf to Walsh Island, and she was packed from stem to stern.

* The keel-laying ceremony was fully reported in the September (1918) issue of *Sea, Land and Air*.

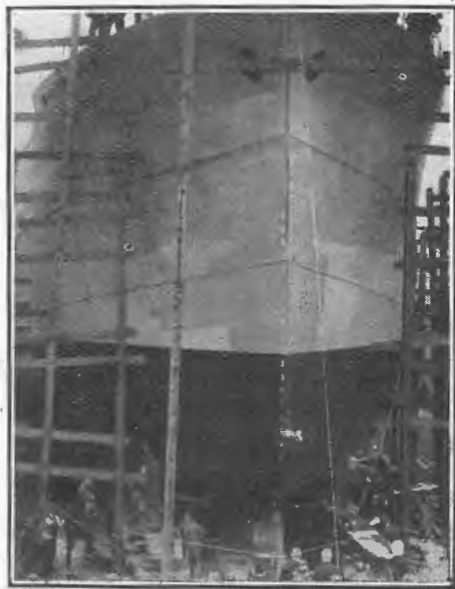
The ceremony was performed by Lady Davidson, and the vessel took the water to the strains of "Advance, Australia Fair," and "Rule Britannia."

The *Delungra* is the largest merchantman that has been built south of the line. Also she is the first of the six ships which New South Wales contracted to build for the Commonwealth Government. Her description is: Length 341ft. over all, breadth 48ft. extreme, depth 26ft. lin. moulded, loaded draught 21ft. 8in. She has 7,680 tons displacement, deadweight is about 5,540 tons, her gross tonnage being about 3,400 tons. She is the type commonly known as the Three Island, having a single deck with

and weighing 860 tons were used in her construction, also 430,000 rivets.

The propelling machinery for the *Delungra*, as well as for the other steel vessels scheduled, will be made in Australia. Six sets are now being manufactured at Walsh Island regarding which good progress, it is said, is being made. The *Delungra* should be running her trials and ready for sea about June.

Dockyard authorities assert that the building was delayed by the irregular delivery of plate and structural steel, for which there was, of course, an unprecedented demand overseas, owing to the war. It was the expansion of the local steel in-



GLIDING DOWN THE WAYS.

H.M.A. Collier *Biloea*, launched from the Commonwealth Naval Dockyard, Cockatoo Island, N.S.W., April 10, 1919; and the *Dromana*, launched from the Commonwealth Naval Dockyard, Williamstown, Victoria, on April 11, 1919.

poop, bridge and forecastle. The hatches are large, with complete and efficient cargo-handling appliances, including eleven steam winches and eleven cargo derricks, one being designed to lift 20 tons.

The propelling machinery consists of triple expansion reciprocating engines and three Babcock and Wilcox water-tube boilers with an indicated horse-power of 2,200 and a speed of 10½ knots.

Interesting to the casual reader is the fact that 2,950 steel plates of varying sizes

and it is interesting to know that 60 per cent of the steel used in the *Delungra* was of Newcastle production.

Amongst those present at the launching were the State Governor and Lady Davidson, attended by Captain Stanham, A.D.C., the Premier and Mrs. Holman, Minister for Works and Railways (Mr. Ball) and Mrs. Ball, the Consul General and Consul for the United States (Mr. Brittain and Mr. Sullivan), Consul-General for Japan (Mr.

Shimizu), Consul-General for Sweden (Mr. J. H. Andersson), Consul for Finland (Mr. Nankler), Vice-Consul for France, President of the Newcastle Chamber of Commerce (Mr. John Reid), Mr. Dodd, M.L.C., Mr. Trethewen, M.L.C., Sir Owen-Cox, Commanders Fearnley and Gardner, Brigadier-General Paton, C.B., C.M.G., V.D., Col. Beeston, C.M.G., and Captain Helsham, O.B.E.

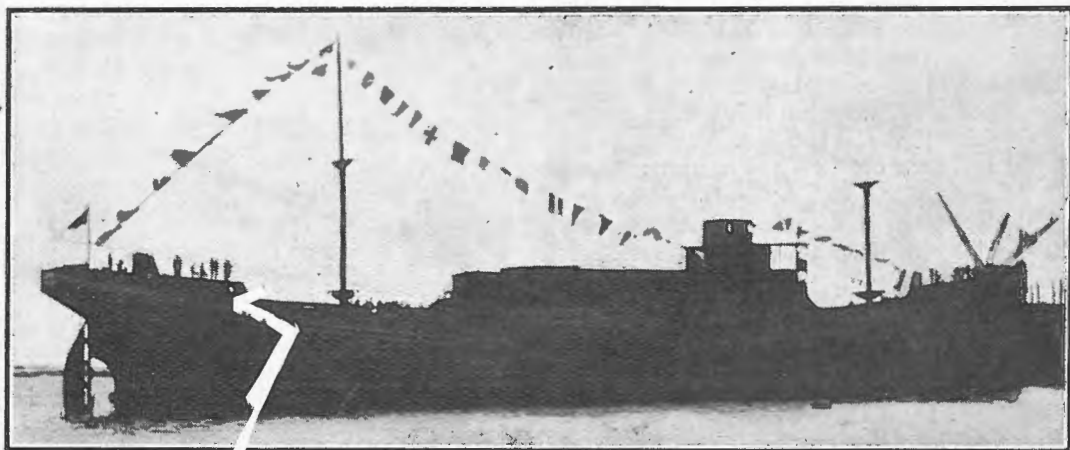
H.M.A. Collier "Biloela."

The *Biloela* was launched at Cockatoo on the 10th of last month (April) by Mrs. J. J. King-Salter, wife of the General Manager of the Dockyard. The weather was fine, and the crowd a large one, in spite of the influenza restrictions.

deck, and a forecastle deck. It took eight months before the *Adelaide* was launched, while the collier was ready in 5½ months, and even that time could have been improved upon had certain industrial troubles been averted.

The *Biloela* should not be compared with an ordinary tramp collier. She has a special construction which enables her holds to be self-trimming, and she has a number of tanks built for carrying oil fuel, necessitating careful work and close riveting. Also the plates rolled in Australia are smaller than the imported ones, and need far more rivet holes and riveting.

The collier was designed by the staff of Rear Admiral Sir William Clarkson,



LAUNCHED.

The *Delungra* proceeding to her moorings immediately after the launching ceremony at Walsh Island, N.S.W., March 25, 1919.

The *Biloela* is the first vessel that has been built almost entirely of materials manufactured in Australia. She has a greater displacement when fully loaded than the *Delungra*: Her total weight then is 10,000 tons, as against the other vessel's 7,800 tons.

It will readily be understood that the building of a collier or a merchant cargo vessel does not involve anything like the amount of work a destroyer, such as the *Adelaide* or the *Brisbane* does. Both these vessels are divided into innumerable bulkheads and several decks, while a cargo vessel consists principally of the outside hull, the main bulkheads—seven in the case of the *Biloela*—only one main deck, a poop

K.B.E., C.M.G., at the Navy Office, Melbourne. She is intended for the carriage of coal, oil fuel and fresh water for the supply of H.M.A. Fleet. The self-trimming holds are specially designed to facilitate the use of grabs, and it is expected that there will be very little manual labor required for trimming.

The vessel is 370ft. long between perpendiculars, and 382ft. over all. She has a 54ft. beam, and is 28ft. in depth. She is of the single deck type, and a draught of 22ft. 6in. Her hold will carry 6,465 tons of coal, and her tanks 1,068 tons of oil fuel and 662 tons of water, besides having a bunker capacity of 1,007 tons. In addition to being fitted as a modern Naval

collier the *Biloela* is equipped for handling general cargo to enable her to engage in coastal trade when not fully occupied in her official capacity. She has four main holds, the spaces being entirely open and her hatches measure 30ft. by 36ft. 10in.

She has eleven derricks, each capable of dealing with five tons, and operated by eight winches 7in. by 12in. These will lift $1\frac{1}{2}$ tons of coal in bags at a speed of 250ft. per minute.

Rear Admiral Clarkson's staff gave special consideration to the strength of the collier and introduced a $\frac{3}{4}$ inch tank top to enable cargoes of concentrates to be carried without over-stressing the structures.

The engines and boilers have been placed aft to reduce the length of the propeller shafting and to do away with the shaft tunnel. They consist of one set of triple expansion inverted type marine engines with cylinders 26in., $41\frac{1}{2}$ in., 67in. diameter stroke 48in., developing 2,500 h.p., driving a single screw of 17ft. 6in. diameter, running at 70 revolutions per minute.

It is interesting to note that the *Biloela* is the first vessel constructed in Australia for which practically the whole of the steel material (the exception being a few thin plates) has been rolled within the Commonwealth. The plates, sections, and the ingots for the propeller shafting and crank shafts were supplied by the Broken Hill Pty., Co., from their rolling mills at Newcastle. The main engines and boilers, except the pressure parts, which are being made by contract in South Australia, are being constructed at Cockatoo, while the auxiliary engines are being built by firms in various parts of the Commonwealth.

The keel of the *Biloela* was laid on the 21st October, 1918, so she took the water within $5\frac{1}{2}$ months of her commencement.

It should be mentioned, in regard to the plates used on this vessel, that the Broken Hill Pty., Co., rolled them as a war measure, their mills being constructed for a different class of work. It is understood that they adapted rail rolls for the plate rolling.

Commodore J. C. T. Glossop, R.N., represented the Naval Board at the launching, the arrangements for which were in the hands of the General Manager, Mr. J. J. King-Salter and his staff.

Among the guests were the State Governor and Lady Davidson, the Lieut. Govern-

nor and Lady Cullen, the N.S.W. Premier and Mrs. and Miss Holman.

The words used by Mrs. King-Salter at the launching were: "I name you *Biloela*, good luck to you, to all who sail in you, and to all who helped to build you."

The "Dromana."

Waving flags and a cheering crowd attended the launching of the *Dromana* at the Williamstown Dockyard (Vic.), on April 11. The ceremony was performed by Her Excellency Lady Helen Munro Ferguson.

The *Dromana* is the first steel merchantman to be built in Victoria, and when within twenty seconds of the moment that Lady Munro-Ferguson cut the silken ribbon, the vessel floated buoyantly on the waters of Hobson's Bay, a great cheer went up from the crowd.

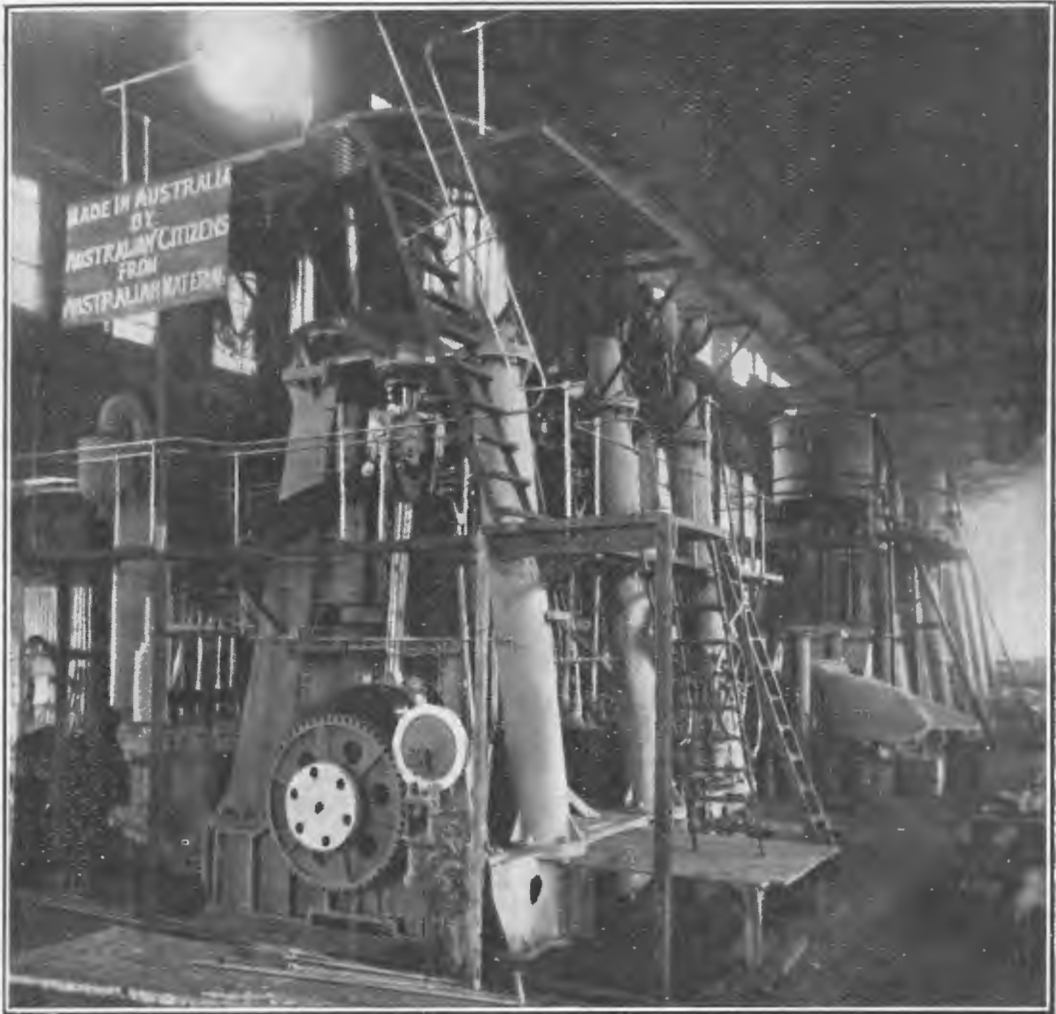
The vessel is a sister ship to the *Delungra*. Her hull towered 50 feet high on the slips, the stern facing the water.

When Lady Helen broke a bottle of Australian champagne on the bows and declared "I name this ship *Dromana*," a humorous incident occurred, for Mr. D. Pickering, manager of the dockyard, was standing somewhat too close, and received a half share in the bubbling baptism.

In a short speech, delivered immediately after the launching, the Hon. A. J. Poynton, Minister in Charge of Ship Construction, gave some interesting details in regard to the new industry. Three more vessels would be launched, he said, within the next three months. The success of the business would depend chiefly upon co-operation. He hoped shortly to ask the Government to make funds available to enlarge the Williamstown Dockyards, so as to allow for the construction of vessels of twice the size of the one which had just been launched. He had been advised by Mr. H. W. Curchin, Chief Executive Officer for Commonwealth Ship Construction, that the cost of the *Dromana*, including interest and depreciation, would not exceed the original rough estimate of £28 per ton. This was particularly interesting, as he had lately been in communication with America, and had learned that it would cost the Commonwealth from £38 to £40 per ton to get a vessel similar to the *Dromana* built there. Mr. Curchin considered, however, that the labour cost in Australia must show a reduction if they were to make shipbuilding

a workable proposition. Comparisons made with regard to the cost of shipbuilding in England during the war period showed that the Commonwealth had had to pay £27,000 more for materials used in the construction of the *Dromana* than it would have been necessary to pay for the materials used in the construction of a similar sized

he could get no reduction in steel plates, the Broken Hill Pty. Company would lower the price of structural steel by £6 per ton. He was looking ahead to the day when the Newcastle steel works would be able to turn out material at almost the same rate as that at which it could be bought in England.



SHIPBUILDING IN AUSTRALIA.

Triple expansion engines in course of construction at the workshops of Messrs. Thompson & Co., Pty., Ltd., Marine Engineers, of Castlemaine, Victoria.

ship in England. The cost of labour, however, had only been £3,900 more than the cost of English labour on a similar type of ship. The machinery had cost £15,000 more than it would have cost in England.

Mr. Poynton said, in regard to procuring material at a lower cost, that, though

Guests present at the launching of the *Dromana* included:—

Their Excellencies the Governor General, Sir Ronald Munro Ferguson, P.C., G.C.M.G., LL.D., and Lady Helen; Sir Arthur Stanley, K.C.M.G., Governor of Victoria; the Acting Prime Minister, Hen.

W. A. Watt, and Mrs. Watt; Rear Admiral Sir William Clarkson, C.B., K.B.E., Shipping Controller; His Grace Archbishop Clarke; the Acting Minister for Navy and Minister for Shipping, Hon. A. J. Poynton, M.H.R.; the Naval Secretary, Mr. G. L. Macandie; the Chief Executive Officer for Commonwealth Ship Construction, Mr. W. H. Curchin; Secretary to the Treasury, Mr. J. R. Collins; President and Chairman of the Melbourne Harbour Trust, Hon. J. A. Boyd and Mr. G. F. Holden; Secretary to the Department of Defence, Mr. T. Trumble; Chief of the Commonwealth General Staff, Major-General J. G. Legge, C.M.G., C.B.; Mr E. A. Eva, Manager of the Commonwealth Government Line of Steamers, and Mrs. Eva; Mr. Fletcher Oakley, Acting Controller of Customs; Hon. L. E. Groom, Victorian Minister for Works and Railways; Hon. R. T. Ball, N.S.W. Minister for Public Works and Railways; Senator and Mrs. Russell; Mr. W. T. Appleton, Managing Director Huddart, Parker Ltd.; Messrs. Plummer (Peninsular & Oriental Steam Navigation Co.), Baker (Burns Philp & Co., Ltd.), and Fullarton (McIlwraith McEacharn & Co., Pty., Ltd.)

Much of the propelling machinery for the Commonwealth Standard ships is being manufactured in Victoria, at Thompson's workshops, Castlemaine. This firm has the contract for the machinery of six

ships, and an imposing mass of engines is already assembled at their works. They include main propelling engines of the triple expansion type with inverted cylinders, the weight of the cylinders being about eighteen tons. The propellers are solid iron castings with four blades 16ft. in diameter, and 16ft. 3in. pitch. The usual type of marine surface condenser is being provided with air pump, the auxiliaries, including main feed, feed donkey, general donkey pump, ballast pump, and make-up feed evaporator.

The boilers are being imported, and are of the Babcock and Wilcox Marine Water Tube type, carrying 180lb. steam pressure, and capable of evaporating 11,500lb. of feed water per hour.

The engineering works are at present somewhat hampered by a shortage of skilled labour.

As with practically every industry the world over the success of shipbuilding in Australia will largely be controlled by the attitude of the Australian workman. If he is amenable to reason it will proceed a-pace and become a source of national and individual wealth. If, on the other hand, he allows labour unrest to perceptibly increase it will gradually cease to exist. For though the Government has given the industry its first impetus it stands to reason that its continuation and development can only be ensured by the continuity of policy and wider scope, which are the distinctive features of private shipbuilding firms.

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HOW WIRELESS MESSAGES ARE SENT

Especially Written for "Sea, Land and Air"

By ERNEST T. FISK, Member Institute of Radio-Engineers

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IV.

[It is claimed that any non-technical reader who carefully follows this series of articles will gain a clear understanding of the main principles which govern the sending of wireless messages. Should the reader find difficulty in grasping any of the points dealt with, we shall be pleased to assist him if he will write, indicating his difficulty.—Ed.]

The mystery of *tuning* wireless stations was explained in the previous article of this series and in that description we explained that it is usual to couple together two circuits.

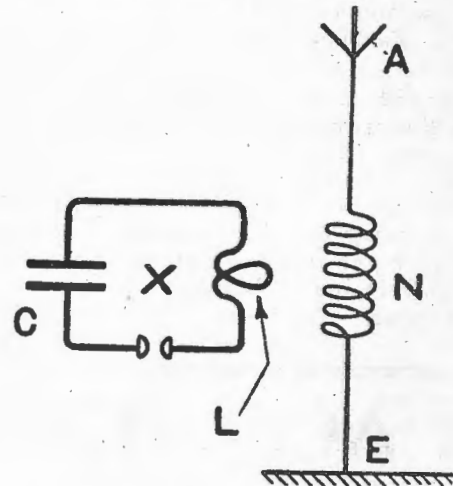
Mechanical methods of coupling a railway engine to a coach have been seen by everyone and most people have also seen an electric motor coupled to a dynamo. The object of these methods of coupling is to transfer power, generated by the first member, to the second member. Harnessing a horse to a cart is not usually spoken of as coupling, but it is done for the same reason and with the same effect. The power of the horse is transferred to the cart through the medium of the harness or coupling.

The same purpose is served by coupling together the two electrical circuits in a wireless sending station. The power generated by the persistently oscillating circuit is transferred to the aerial circuit through the electrical coupling. The necessity for these two circuits and their important functions in modern wireless stations were fully explained in the third article of this series to which the new reader can refer.

In the case of a mechanical coupling we have something tangible which can be seen and readily understood by all, *i.e.*, the stout links coupling an engine to a train, or the harness which transfers the pull of a horse to a cart; but the electrical coupling between two circuits is invisible and intangible. It is by freely making use of analogies with things which can be seen and felt that we are able to readily understand those great unseen silent forces of magnetism and electricity. The unseen link between our two circuits in a wireless sending station is magnetism. It is the same link which frequently permits a telephone conversation passing over a line to be heard

on another line suspended from the same street poles.

All who have followed this series of articles remember that the rapidly oscillating electrical currents in the sending apparatus produce a rapidly changing magnetic force which surrounds the circuit whenever a magnetic force cuts across an electrical conductor, such as a wire or a coil of wire, a current will flow through the conductor; therefore,



Diagrammatic Sketch of Coupled Wireless Circuits.

the oscillating current in one circuit can be made to produce a similar current in another circuit which is placed in a suitable position near the first.

In order to have efficiency between these two circuits both must be tuned to the same wavelength, that is, their natural frequencies of electrical oscillation must be alike. If they were different the second circuit could not respond effectively to the first and scarcely any energy would be radiated from the aerial. This is similar

to the tuned and untuned piano strings previously described.

When these coupled and tuned circuits were first used a very remarkable and interesting phenomenon was noticed. Although the circuits were carefully adjusted to the same wavelength it was found that the aerial gave two different wavelengths, one shorter and one longer than that to which it had been tuned. This was subsequently found to be caused by the interaction between the two circuits; as the energy from the first circuit was gradually transferred the second circuit reacted and gave some of its energy back to the first.

This undesirable effect was reduced by setting the circuits further apart, or in other words by loosening the coupling. Subsequently better methods were discovered, one by Dr. Marconi, and one by Professor Wien, in Germany, by which the first circuit was broken as soon as its energy was transferred to the second, so that no reaction could take place. This method is popularly known as the "quenched spark."

A very simple and beautiful experiment can be made by anyone to demonstrate most of these wonderful properties of coupled wireless circuits. This experiment was first described by Dr. J. A. Fleming, and the only materials required are a piece of string, two nails, and two small weights.

To carry out this experiment one piece of string about three feet in length should be loosely and horizontally suspended from the nails. The weights, which should be alike and may be any convenient pieces of metal weighing a few ounces each (plumb bobs are very suitable), should be vertically suspended with string, like pendulums, from the horizontal line to which the pendulums should be loosely attached, so that they can be moved closer together or further apart.

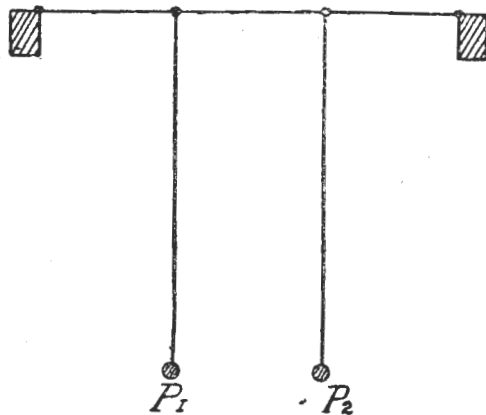
For the first experiment the pendulums must be of equal lengths. If we set one pendulum swinging freely, while the second pendulum is at rest we shall see the second gradually absorbing energy and swinging in sympathy with the first. Eventually the first pendulum will come to rest, but at that moment the second will be swinging vigorously. The first pendulum will start again and its energy will increase, while the second decreases to the point where it is at rest, and the first is again in full swing.

This is a very simple and instructive ex-

periment which demonstrates the operations of our tuned wireless circuits. The first pendulum is analogous to our primary oscillating electrical circuit in which the energy is generated. This energy is passed through the coupling to the secondary or aerial circuit, which is analogous to the second pendulum.

Interaction between the two electrical circuits is demonstrated by the reaction of the second pendulum on the first.

If the pendulums are placed close together the energy is passed from one to the other more quickly than if they are well separated, this is equivalent to making the coupling looser between the circuits.



String and Weight Pendulums to demonstrate Coupling and Tuning.

The advantage of the quenched spark can be demonstrated by removing the first pendulum when it comes to rest. This can be done by lifting it so that it cannot swing and we shall then notice that the second pendulum continues swinging for a much longer time. As a source of energy the second is then more efficient because its energy is not taken by the other pendulum. Another demonstration with this simple apparatus will illustrate the necessity of having the two circuits *in tune* with one another. The *frequency* of the oscillations in the pendulums depends upon the length of the string, and if one string is longer than the other we shall see that the first pendulum fails to set the second in motion. That is because they are out of resonance and since the second cannot swing in step with the first it cannot absorb energy from it. Therefore, in our two wireless circuits the aerial cannot receive energy from the primary circuit unless both are tuned to the same frequency or wavelengths.

(To be continued.)

WITH THE AUSTRALIAN FLYING CORPS

Especially written for "Sea, Land and Air, by "WINGS," A.F.C.
(Continued From Previous Issue)

Training.

For the past eighteen months the Avro has been the machine in general use at the Australian training squadrons. Based on the 1912 model, it is one of the most perfectly designed aeroplanes we possess. As my instructor used to say, when a pupil crawled out unscathed from what appeared to be the most appalling crash, it is a kindly bus to "Huns."

Its designer, Mr. A. V. Roe, who struggled along as an enterprising mechanic at Brooklands in pre-war days, existing chiefly on faith and an unquenchable enthusiasm for the heavier-than-air machine, has reaped a rich reward for his labours. In the early days of the war it was fitted



The Avro.

The most famous of all training "busses."

with an 80-h.p. Gnome engine and had the distinction of being the first British bus to bomb Karlsruhe. To-day flying men marvel at the performance, and no instructor would dream of sending his pupil on a cross-country on an Avro fitted with anything less than a 110 h.p. Monosoupape, a rotary engine very similar to the Gnome in design, which is the most popular and generally used engine for the Avro machine.

I had the good fortune to be sent to a squadron which started its pupils on Avros. Every flying man loves the Avro. It is the ideal bus for tuition, extremely delicate and sensitive on the controls, and possessing the supreme virtue of being able

to perform practically every stunt of which a service bus is capable, so that the novice can receive full instruction in stunting before venturing to try it for himself.

It takes only a few hours of dual instruction on an Avro before the pupil begins to feel at home in his machine. He immediately starts to dream of solos, but before that ideal can be achieved he must, above all else, be proficient at landing his bus.

Landings are the bugbear of the beginner's life. Bad landings mean crashes, which are not regarded with approval by the squadron commander, and which are also apt to do a little damage to the occupant. Unless the difficulty of landing properly is overcome, the novice will never make a useful pilot because it is an ever-present problem, and one which even the most efficient pilot cannot afford to treat carelessly. I have known several men who were ideal stunters, but who, from constant trouble with landings, broke into a cold sweat at the prospect of coming down, and quite a number have had to be washed out of service flying altogether on account of this.

The beginner's landings provide a fruitful source for flying stories, and every squadron possesses the man who, on his first solo, was so scared at the prospect of attempting to land that he stayed up until the bus ran out of petrol, and simply crashed in the nearest field. The best of pilots have a bad run at landings, and when this spasm sets in the man returning from the line is much more worried by the necessity for coming down than he is by the attentions of "Archie."

As a rule, however, the novice is fit for his first solo at the end of about eight hours of dual control. The keen pupil, who is often ready much earlier than this, is very eager for the event, and chafes under the delay of constant duals, but one morning when the sky is clear and the wind quiet, the instructor, after a few test landings, suddenly stops the machine, jumps out, and with a pat on the pupil's shoulder, says: "Now off you go on your own; you're quite all right."

I have never been able to discover whether the pupil or the instructor is the more worried about the event. Until it is over no instructor can be certain as to how his pupil will perform. Temperament plays such a big part, and the man who is full of confidence at dual may become the most nervous of beings when alone. The stoutest man feels that queer little sinking sensation when, for the first time he opens the throttle, pushes forward the stick, and "takes off"—solo. The instructor never takes his eyes from the machine, and when you see a man on the edge of the tarmac hopping about like a keen enthusiast at a football match you can guess a first soloist is up. Once the pupil is a thousand or more feet high he is all right, for there is safety in height.

Most of our machines, especially the Avro, are stable busses, which means that if they have only sufficient height to do it they will right themselves before hitting the ground and give the pilot a chance to regain control. The essential thing for the first soloist is to keep up flying speed, without which the machine will stall and allow the law of gravitation to come into its own.

The sinking feeling with which the pupil sets off returns with tenfold force when he shuts off his engine to land. It is a moment of supreme joy or agony according to the result. The instructor on the ground is shuffling about, changing his helmet from one hand to the other and whispering words of advice which can never reach the pupil. "Hold her off. Hold her. . . . Flatten out! Keep her. . . . Oh, good man! A lovely landing," and by the time the machine has stopped and the pupil begins to taxi in he has raced half way across the landing ground with a face beaming with satisfaction. It is the happiest day of the pupil's life when he has done a successful solo, and after that, when he continues to fly alone, with only brief intervals of dual to test his progress, he comes completely under the sway of this fascinating game.

It is a short step now to the stunts. These are carefully taught by the instructor, because without them the scout pilot would be of little use in the field, but more especially because they tend to give the pupil unbounded confidence in his machine.

To loop is the ambition of every beginner. It is of little practical value for

fighting, but it is the most talked-of stunt, and marks a definite stage in the pupil's progress. When an instructor sees his man sitting over the drome "chucking loops," he probably growls about the way the engine is being raced to pieces, and makes a few remarks to the pupil when he comes to earth which tend to curb this particular craze. But secretly he is very pleased, because he knows that it is the stuff of which the good scout man is made, and that his pupil has reached the stage when caution rather than confidence needs to be imbibed.

The first loop performed alone has a remarkably exhilarating effect. You feel



Result of Bad Taxi-ing.
Machines in collision on the ground.

that at last you are on the way to become a *pukka* stunt merchant, and very proudly enter your work into the record book as "aerobatics." It is really the easiest of performances if done on the right sort of bus, but it possesses the great merit of turning the pupil upside down—a position in which he is destined to spend a great deal of time if he lives to fight real Huns.

It is difficult to define a stunt, because things move very rapidly in the flying world, and what is a stunt to-day becomes

part of the programme to-morrow. But for general purposes most things that differ from straight-forward flying are regarded as stunts. With few exceptions they are not in the least dangerous, provided they are not attempted on an unsuitable make of machine and that the pilot keeps at a reasonable height. If stunting brings a man to grief it is practically always because it is attempted at too low an altitude. In nearly all stunts there is a fraction of time when the machine is not fully under the pilot's control, and unless there is sufficient height for a recovery to be effected, the slightest slip may bring disaster.

The Scout Pilot.

To be a scout pilot is the ambition of most flying pupils. It was once an axiom of the Flying Corps that the best pilots should fly the little wasp-like scout machines



The Sopwith "Pup."
The pupils' favourite "joy-bus."

while the medium men, or worse, were relegated to bombers and artillery machines. But that was in the bad days when training was a most haphazard affair and flying was regarded as a wild adventure. Instructors were chiefly men who had been returned from France for nerves, and sometimes even those who were not considered good enough for the fighting area. Pupils were pushed off on solo almost as soon as they could distinguish the throttle from the joy-stick, and for the most part it was a question of luck whether they crashed or scraped through unharmed.

This lack of system which was too wasteful, and which produced too many misfits was never in vogue at the Australian training squadrons. It was discovered that

if a man could not fly sufficiently well, after the proper sort of training, to be a scout pilot, he would be of very little use on any other bus. The work he was best fitted for depended more on temperament than flying ability. A rough division was dash and enterprise for scouts, steadiness and the art of taking pains for artillery machines.

Instructors were picked from among the best flyers, and given an excellent course of training in the proper way and the proper things to teach pupils. It was then pretty well left to the man himself to decide what sort of machine he would fly. No pupil was ever forced to fly scouts if he expressed his desire to fly two-seaters. Scout flying was the more adventurous work in the field, and suffered the greater casualties.

The Australian flyer seemed to be specially adapted for this class of work, and our two scout squadrons were rated among the cream of the squadrons in France. The principal duty of scouts was to carry out a continuous offensive. Flying in formation, sometimes a flight of six machines, sometimes the whole squadron numbering 18, and on rarer occasions a combination of as many as 30 and 40 machines, they scoured the sky for the Hun and tried to keep him well over his side of the line, so that our artillery machines could proceed with their work of co-operation with the land forces unmolested from the air. To them fell the bulk of the air fighting, and it was from the ranks of the scout pilots that came the men who have achieved the highest honours of flying.

Apart from bombing, the greatest use made of aircraft during this war has been to increase the efficiency of the land forces by its co-operation. This work took many forms. With the day-bomber it was twofold, because by the destruction of material behind the lines he indirectly reduced the efficiency of the enemy, and as he combined his bomb-dropping with photography and observation, he brought back accurate information from which a trained intelligence staff could forecast the intentions of the enemy and accurately map his country.

With the artillery squadrons this co-operation was direct, both with the artillery and infantry. These co-operating machines were all two-seaters. It was their duty to carry out their work with as little inter-

ruption as possible. If an artillery pilot pushed down a Hun machine, as was frequently the case, it was regarded as a meritorious performance only in so far as it enabled him to carry out his definite job the more successfully. If he deserted his work for the joy of giving battle there was more trouble than praise for him when his report that he had scored a Hun coincided with a telephone message from the artillery commander to say that his battery had been compelled to stop work because the co-operating machines had cleared off in a chase after Huns. But even on the best protected sectors the artillery pilot was often in a scrap. Flying at about 5,000 feet, he was the constant target of a well-exercised "Archie" and the prey of all Hun chasers who succeeded in eluding or overwhelming our scouts. When he did fight it was usually against odds. I have only known but very few instances where a single Hun made an attack. On one occasion a pilot from No. 3 squadron was returning to his drome when he was tackled by six Huns, and succeeded in pushing down two among the wreckage of Peronne and making good his escape.

As soon as a pupil became an efficient flyer he began to specialise, according to the work he would do in the field. If he was to join a scout squadron he confined himself almost entirely to air-fighting. He set out to become a complete master of his machine, to manoeuvre with great rapidity and to become very accurate with his machine guns.

By the time he had completed about 20 hours' solo on Avros he was transferred to his first single-seater—the Sopwith *Pup*. With this machine he could "stunt" to his heart's content and get accustomed to the peculiarities of a single-seater before being passed up to his service machine. The *Pup* is a frail little thing, and can nestle comfortably on the wings of a Handley-Page. She is a comparatively difficult bus to land, and demands good judgment and great care, which is excellent practice for the man who is approaching the end of his training. The *Pup* invites the pupil to joy-ride—she is so light on the controls and so easy to stunt. But if the pupil was wise he devoted the ten hours or so which were usually given him on this bus to perfecting himself in all branches, for it would be of inestimable value to him on his service machine. Once he had boarded an

S.E.5, a Sopwith *Camel* or a *Snipe*, it was only a question of a few flying hours, occupying probably no more than a week, before he was sent to one of the R.A.F. finishing schools, where he was allowed to wear his wings and from where he joined his squadron in France. If there had been any branch of his work which he had neglected to thoroughly master or any necessary but nerve-trying feat which he had funked, he would bitterly regret it. The instructor could only carry his pupil a certain way, beyond which the pupil must depend upon his own resource and initiative. He could choose the easier way and remain undetected, but the work he shirked would have to be done one day, and if he put it off until he reached France it was probably too late.



The Service 'Bus at Last! .
The Sopwith "Camel," with which No. 4 Squadron, A.F.C., obtained a record bag of Huns.

While the training lasted the scout man had the more enjoyable time. When he was sporting with the elements without a moment's monotonous work to do, his brother pupil on the artillery machine was spending hours assiduously practising steadier and less exhilarating tasks. He was confronted with a series of tests, all of which he must pass before he could hope to leave the training squadron. His machine was not one on which he could, with safety, do much stunting. It is not good or wise to loop, roll, spin or overdrive an *R.E.8*. Some men do these things and come to no harm—sometimes. Others attempt them and meet with immediate disaster. It is a bus not built for stunting. The pupil would be of more use to his future squadron if he devoted his time to constant practice at bomb-dropping, photography, wireless and co-operation with a

battery until he had got the work at his finger-tips. His curriculum was by no means uninteresting, but it required patience and application, and while he was attending to it he must learn to throw his bus about to the full extent of which it was capable so that he would be ready for the emergencies which were sure to arise.

Beyond the general programme for artillery work there was no special training for the man who joined a contact patrol flight. Any artillery pilot might find himself drafted to this flight, although, unless there was a shortage, he was usually given the choice. It was regarded as the sticki-

est job in an artillery squadron owing to the fact that it had to be conducted at low altitudes, and therefore within easy reach of machine guns as well as "Archie," and as it usually coincided with a hop-over by the infantry, both could be relied upon to be pretty active. The actual work of contact was always carried out by the observer because the pilot was fully occupied in keeping a watch for enemy aircraft and in twisting his machine about until it almost resembled a joyously excited dog, in the hope that he would prevent the constant fire from the ground becoming too accurate.

MELBOURNE TO SYDNEY NON-STOP FLIGHT PROPOSED

During the past month the editor of this journal was favoured, while visiting Melbourne, with a further interview with Major-General J. G. Legge, C.M.G., C.B., Chief of the Commonwealth General Staff.

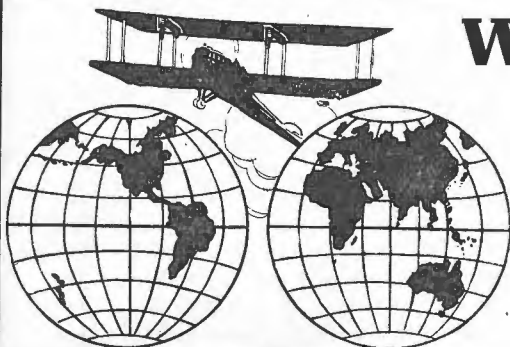
We suggested that as the average newspaper reader had not understood the difficulties attendant on the recent relay-flight from Melbourne to Sydney, it might be well to arrange a non-stop flight on one of the more modern machines imported a short while ago by the Department of Defence.

We reminded the General that at the Central Flying Schools, at Point Cook Victoria, there are a number of brand-

new, high-speed aeroplanes, notably the Sopwith *Pup*, also that more than one member of the instructional staff at Point Cook had confidently assured us of his ability to complete a non-stop flight to Sydney in one of these machines, leaving Point Cook in the morning and reaching Sydney the same day in time for lunch.

General Legge agreed that there was not the slightest doubt that this could be successfully accomplished, and has promised to give our suggestion his careful consideration.

The project will be kept before the Department of Defence by the Australian Aero Club in Melbourne, and we may hope to report a record flight during the next few weeks.



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PART III.—CONCLUSION.

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In 1906, when the mail contract made by the Orient Company with the Commonwealth Government came into force, the Pacific Steam Navigation Company, which had been in partnership with the Orient Steam Navigation Company for 27 years, withdrew, transferring its interest to the Royal Mail Steam Packet Company, and the four steamers then flying the P.S.N. Co. at the main hauled it down and hoisted the white ground with a red diagonal cross, and crown in centre, the house flag of the R.M.S.P. Company. These vessels were the *Oratava*, *Oroya*, *Ortona*, and *Oruba*, and the name of the line was changed from the Orient-Pacific Line to the Orient-Royal Mail Line.

This was not the first time that the Royal Mail Steam Packet Company became identified with an Australian mail service. This company was incorporated in 1839, and, at the time it joined the Orient Company, had a capital of a million and a half, and a fleet of thirty-eight steamships trading to the West Indies and New York. Its interest, however, with the new venture was confined to the four steamships mentioned.

In 1858, when the European and Australian Royal Mail Steamship Company failed in its contract with the Australian Governments to carry the mails between Suez and the colonial ports, and with the British Government, between Southampton and Alexandria, the Royal Mail Steam Packet Company came to the rescue, by not only taking over the contract, but the company also. But it was not a financial success, and by May, 1859, the Peninsular and Oriental Company got the contract, at the same time purchasing some of the vessels which the R.M.S.P. Co. had in the line.

In 1906, at the annual meeting of the Pacific Steam Navigation Company, the chairman said: "The Australian business was apart from our original and natural sphere of action, into which we had origin-

ally drifted, and the results of which had been obviously disappointing." In this we see why it sold out, and it remains to be seen what the purchasers could make out of it.

The reconstructed company commenced operations on January 1, 1906, working under the contract of 1904, which was for no fixed time, but subject to a two years' notice of termination.

At this time all the original vessels had been withdrawn, and those engaged in the service were the *Ormuz*, *Ophir*, *Omrah*, and *Orontes*, belonging to the Orient Steam Navigation Company, and the *Orotava*, *Oroya*, *Ortona*, and *Oruba* belonging to the Royal Mail Steam Packet Company. Of these two were twenty years old, two sixteen years, another was fourteen years, while the more modern vessels included one of six years, one of four years, and one of three years.

The older boats had been modernised and refitted, and brought as close up to date as possible, and they continued to carry out the contract in the satisfactory manner which had characterised the company's *modus operandi* from the initiation of the service thirty years before.

However, these are progressive times, and the Commonwealth Government, for reasons best known to itself, called for tenders for a new service early in 1906, to alternate weekly with the Peninsular and Oriental Company's contract, which is with the British authorities.

On July 10 the Prime Minister announced in Parliament that a contract had been accepted, and signed on the 7th, subject to ratification by Parliament. He stated that the successful tenderers were Sir James Laing & Sons, of Sunderland, England. The term was for ten years, to commence in January, 1908, and the subsidy was £125,000 per annum. The question was raised in the House as to the standing and financial position of the firm;

the Government cabled to the Agent-General, and in reply were assured that the contractors "were in high repute and very strong financially."

Those who knew anything of shipping or shipbuilding in England for the previous fifty or sixty years would endorse the description of a firm who throughout that period had been building ships on the banks of the River Wear, at Sunderland. James Laing was building ships at this place in the 1830's and 1840's, and down to the present time his name is associated with that great industry. All the noted ships which came to Sydney in the long ago under the flag of Duncan Dunbar, come from his yard, notably the *Dunbar*, *Duncan Dunbar*, *La Hogue*, *Parramatta*, *Vimeira*, and dozens of others; so who would not speak well of a firm of such long standing?

It is Longfellow who says, in "A Psalm of Life," *And things are not what they seem*; words which appear to be full of meaning when taken in conjunction with the above mail contract.

It was stated in the Press that a company was to be formed with a capital of £4,000,000, to be called the Australasian Royal Mail Line, and to be registered in Melbourne. The whole project, however, collapsed, and with it the firm of James Laing & Sons. But that is not the story of the Orient Company, the management of which were naturally chagrined when they found they were not the successful tenderers, and the chairman of the annual meeting of the Company, held in London that year, is reported as saying: "We were the first to run a line of full-powered steamers between England and Australia, and we have consistently pioneered the development of that trade, as, for instance, in the carrying of refrigerated cargo and the building of twin-screw steamers. Our policy, in short, has been to secure that each new steamer should be as up to date as the science of shipbuilding and our own experience could ensure. . . . The contract for the carriage of mails between England and Australia, which we for twenty years have punctually performed, has passed into other hands. With regard to this I may perhaps be allowed to say that if the new contractors can do what they have undertaken and show a profit, we shall have to confess to a grave miscalculation."

But as the contractors could not put

their contract into concrete form, having neither ships nor capital, the Government, after much correspondence and delay, cancelled it, and called for fresh tenders, when that of the Orient-Royal Mail Line was accepted.

The principal terms and conditions were a subsidy of £170,000, steamers of 11,000 gross tonnage, a 17-knot speed, mails to be delivered in 638 hours (instead of 696 hours), vessels to call at Fremantle, Adelaide, Melbourne, Sydney, and Brisbane, and at least six of them at Hobart during the months February to May inclusive.

It provided for the *Orontes*, *Omrah*, *Ophir*, and *Ormuz* to be used, and five new ships to be specially built, and two others to be added, within eighteen months and six years respectively from February, 1910, at which time the contract was to come into force and continue for ten years, to February, 1920.

In the meantime the old contract would continue, the cost of which was £146,000, including £26,000 which was being paid for the extension to Brisbane.

The Orient Company did not get their tender accepted without competition. There were three tenders lower than theirs, but, as stated by the Prime Minister when making the announcement in the Federal Parliament, they were of a speculative character, and did not offer the advantages desired.

At the date the announcement of the contract being signed with the Orient Company was made in the local newspapers, a cable message said: "The directors of the Royal Mail Company announce that some time ago they gave notice to the Orient Steam Navigation Company that they intended to terminate the existing agreement as the Royal Mail Company desired to in future transact all the business of their steamers."

The Royal Mail Steam Packet Company remained with the Orient during the currency of the running contract, but severed its connection at the end of 1909. At what time the Royal Mail Steam Packet Company gave to the Orient Company the notice of their intention is a matter of which outsiders have no knowledge, but it was stated in the Press that the strongest opponent the Orient Company had to securing the mail contract was its own partner, the Royal Mail Steam Packet Com-

pany, who offered to build a number of large steamers for the purpose.

It is probably, therefore, that notice of severance was given when they put in a tender for the mail, and that they had the intention of continuing in the Australian trade is certain, for later, in May, 1909, the chairman of directors told the shareholders as much.

To prepare the Australian public for the class of vessel that would take up the trade, the splendid steamer *Asturias* was sent out early in 1908 as one of the Orient Royal Mail Line.

The *Asturias*, described by a London paper as "the finest steamer that has ever entered the port of London," was built by Harland & Wolff, Limited, of Belfast, was of 12,500 tons, and reached Sydney on March 7, 1908. She attracted much attention at the time, as she had all the most modern appliances and fittings for the comfort of passengers, and as Captain Jenks had the command she was regarded as one of the new boats for the new contract by the public. However, she only made one more trip to Australia, arriving at Sydney in March, 1909, being withdrawn when the Royal Mail Steam Packet Company ceased its connection with the Orient Steam Navigation Company, the former not carrying out its threat to continue running their steamers to Australia on its own account.

By the terms of the new contract, which was to come into force in February, 1910, the Orient Company was required to build five new mailships. No time was lost in getting these underway, and the first was launched on November 7, 1908, and named *Orsova*. She came from the yard of Messrs. John Brown & Co., Clyde Bank, Glasgow; her tonnage was 12,036 tons, an overall length of 553 feet, with a breadth of 63 ft. 2 inches.

She was followed in two weeks by the *Otway*, which came from the works of the Fairfield Shipbuilding and Engineering Company at Govan, on the Clyde, the launching ceremony taking place on November 21. The next vessel to take the water was the *Osterley*, and great preparations were made for her to do so, the Countess of Jersey being on the spot to christen her. There was an appropriateness in this, as the Earl of Jersey had been Governor of New South Wales and *Osterley Park* was the name of his residence in

England. But "the best laid schemes of men and mice gang aft agley." All went well up to a certain point, and that was when she should have commenced to move, but did not. It was then found that the tallow used on the ways had become frozen, so the launch had to be given up for that day, January 21, 1909. She was successfully launched, however, on the 26th at the yards of the London and Glasgow Shipbuilding Company, at Govan, her designer being Mr. J. W. Shepherd, the managing director, who, about 30 years previously, was responsible for the *Orient*.

The fourth steamer was the *Otranto*, built by Workman, Clark & Company, of Belfast, and which on the day it was decided she was to take the water, positively refused. A few days later, March 27, she was persuaded to move off, the grease on this occasion was also responsible.

On July 6 the same builders launched the *Orvieto*, the fifth, and last to complete the number specified in the contract. These vessels were practically of the same size and tonnage, were built of steel and fitted with twin screws.

These steamers were not held back to take up the running when the date of the contract time arrived, but as each one became ready she was placed on the line, the *Orsova* arriving at Melbourne on August 5, 1909. Captain Ruthven, the commodore of the fleet, in command. It was pointed out at the time of the *Orsova's* arrival that she was seventeen times larger than the Chusan, the first Peninsular and Oriental mail steamer to arrive in Australia, 57 years before.

The *Otway* followed, arriving at Sydney on August 21, 1909, Captain Symons being in command, preceeding the *Osterley* by a month, this arriving at Sydney on September 19, Captain Jenks in charge. The maiden voyage of the *Otranto* was made under Captain Coad, R.N.R., Sydney being reached November 13.

The remaining vessel of the mail contract arrived at Fremantle on December 30; thus the whole of them were built and had made the voyage to Australia within two years of the confirmation of the contract. This was the *Orvieto*, and she also was brought out by Captain Ruthven.

All these vessels and others on the line sailed under the flag of the Orient Steam Navigation Company, and the title by

which it is known, is its original one, The Orient Line.

These vessels were supplied with a powerful Marconi wireless equipment, and it is interesting to note that the first vessel of that line so equipped was R.M.S. *Otranto*, in which the Marconi Company appointed a member of their specialist staff to demonstrate the working on the first voyage to Australia and on that voyage record communications were established; a message to the Orient Office in Sydney was sent from the *Otranto* 300 miles north-west of Fremantle, direct to H.M.S. *Powerful*, which was anchored in Sydney Harbour.

With these splendid vessels and a few of the older ones, such as the *Ophir*, *Ormuz*, *Omrah* and *Orontes*, the Orient Line opened its contract in February, 1910, expecting according to its terms to be fully occupied for the next ten years.

In addition to the steamers mentioned the Company had to provide another steamer within 18 months of date of contract, so while the fleet was busily employed the firm of John Brown & Company, of Clyde, bank were building the largest vessel as yet in the service, and which was launched and named *Orama* in June, 1911. She was 13,000 tons, and was technically described as having "propelling machinery consisting of two independent set of reciprocating triple-expansion engine working in conjunction with a low pressure Parsons turbine." She was also fitted with triple screws. In general appearance she was similar to the five previously mentioned, but she had greater speed, doing $18\frac{1}{2}$ knots, and possessed all the very latest devices in her passenger accommodation. She was "An Ocean Greyhound" and Captain A. J. Coad, R.N.R., held the leash. She arrived at Fremantle on December 13, 1911, and Sydney, December 21.

The last vessel to fulfil the terms of contract was laid down in the same yard and launched in 1914, she exceeded all the others in size, being 600 feet long and 15,000 tons, and was fitted with geared turbine engines. In appearance she is unlike the other vessels, because she has a cruiser stern, an innovation for ships in the Australian trade. This beautiful ship,

the model of those of the future, has visited Sydney during the period of the war, but the public have not had an opportunity of seeing her, as admission to the vessels was forbidden.

When war was declared in August, 1914, the Orient Company had a full fleet according to terms of contract to carry on its business, the contract was suspended and the Company's vessels taken over by the British Government. Some of them were converted into armed cruisers and others were utilised as transports. Among the former were the *Otway*, *Orama*, *Omrah* and *Otranto*, this last being present with the British squadron off the coast of South America when Admiral Cradock was defeated by Admiral Von Spee. She survived the heavy fighting to be lost on the north coast of Scotland when carrying American troops, by being in collision with the Peninsular and Oriental s.s. *Kashmir* on October 6, 1918.

The *Otway* was torpedoed and sunk in North Sea on July 22, 1917, when ten of her crew were killed.

The *Orama* met a similar fate on October 19 same year.

The *Omrah* was added to the list of torpedoed vessels on July, 1918.

To close the list the beautiful steamer *Asturias*, which made two trips as an Orient liner, had been converted into a hospital ship, but this did not save her from the German submarine, which sank her on March 20, 1917. Fortunately, she had landed all her sick and wounded and was making her way across channel. The German excuse was that she was being misused as a troopship.

Another large steamer was torpedoed in the eastern Mediterranean on April 15, 1917. She was then known as the *Arctadian*, but when she was in the Orient line her name was *Ortona*.

Occasionally an Orient steamer visits Sydney, recently the *Orontes*, *Orsova* and *Osterley* were here, but it will be some time before the mercantile marine comes into its own. Shipbuilders will be busy before the Orient Line is again fully equipped, and having regard to past services Australians will be sympathetic and patient.

WOMAN'S SHARE IN VICTORY

PART II.

HER WORK ON TERRA FIRMA

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

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Last month a brief survey was made in this journal of the part taken by women in the maintenance of war-time efficiency by sea and air. Her work ashore has been equally essential to victory. Much still remains to be told of her splendid courage and endurance.

In Australia women have been busy although the extent of their work is not generally known. The Red Cross, that glowing example of woman-power organisation, covered a field quite as wide as in the countries nearer the war zone. It will surprise many to know that Australian girls have ploughed the soil and sown grain; cleared scrub and built houses. They have driven taxis, conducted buses. The extent of their war work is worthy of an article to itself. First, however, some idea may be given of what has been done abroad.

The branch of feminine industrial labour most familiar to us at present was in connection with the munition factories. Woman is said to have shown remarkable aptitude in the manufacture of such articles as fuses and percussion caps, whilst her serenity in the danger zone has reaped for her a harvest of admiration and respect.

Her work in rural pursuits has not been so widely circulated. We have been told that she has done much; even that "society butterflies" used to go down in batches to the farming districts for the haymaking, "proving a godsend" to the farmers. Such scraps of information are not however convincing, and little has been told of the solid graft put in on the land by thousands of women in Britain. How they took short training courses in milking and other light forms of farm labour, and how gallantly they "slogged in" during all weathers. Even dwellers in sunny Australia can realise that it would be no cheerful task to get up in the chilly darkness of an English winter's morning, and go out in the sleet and mud to feed stock and milk cows. There is proof that there was little shirking of uncongenial tasks in the fact that to-day British farmers advertise especially for women farm hands, of-

fering what would, till recently, have been considered incredibly high wages.

In 1916 a well-known Englishman said it was his conviction that the war would be won on the cornfields and potato fields of Great Britain. They certainly had a good deal to do with it.

But it was not only the women of Britain who worked. Little has been told to Australia of the Allied countries. Of those grim amazons, who, naked to the waist, stoked the furnaces of France. Of women, once puny misfits, whose brawny arms ultimately tossed thirty and forty-pound shells with the ease with which they had been accustomed to handle artificial flowers.

In the grape-growing districts of France women actually tended the vineyards in the valleys which separated the opposing armies. They consistently risked their lives rather than let the vintage fail. Guns thundered on the hillsides, shells hummed overhead, yet they went calmly on with their pruning. At intervals the Germans would rake the valley with shrapnel and then only would these women desist from their labours, throw themselves flat upon the ground and wait, sometimes for hours, till the fire was lifted.

Up to 1917 the women of Rheims had not closed their shops. Assuredly "business as usual" was their motto. They filled their windows with sandbags, instead of enticements, and traded by lamp-light through the awful music of Mars.

In 1916 a little French girl was decorated for Bravery in Emergency by the President. She was an only child and her mother died about the time her father, a baker, was called to the trenches. The bakery, which was the only one in the district, was on a direct route to the front and was therefore an important source of supplies.

For the first twenty-four hours after her double tragedy the child was invisible—absorbed, the neighbours decided, with her grief. Then suddenly the windows of her shop were unshuttered and were found to be piled high with loaves of precious bread!

For twelve months she toiled there, un-

aided, her valiant childish arms kneading all the dough. The demand grew amazingly, for the village was a regimental halting place, and the whole supply of bread was often bought out of hand. When her father came back a year later, and minus a leg, she was still "carrying on." She had a peasant's hardiness and the soul of Horatio.

Women's work in war-time has been an overwhelming success, but it must be admitted that all was not plain sailing when the feminine element first entered the munition factories. Woman would then sometimes behave in an unreasonable manner, quite bewildering to a foreman accustomed to dealing with men. A temporary cessation of work, for instance, effected by a machine getting out of gear, would cause her to fret and fuss quite unnecessarily. Her reason, though she was usually too inarticulate to define it, was that she hated "standing by" and being balked, as it were, in the middle of her job.

Practically the whole of the women of Britain offered themselves for war service.

Out of the thousands applying to work in munition factories only about five per cent. were discharged as unsuitable after the probationary period. Remarkable adaptability must therefore be conceded to them.

Girls were often at first "scared to death" of the huge machines it was their destiny to tend. They had to be coaxed to go near them. But by degrees they lost their fear, and soon we find one writer remarking on the "caressing touch" of a woman's fingers as a bore is being urged on the machine. This touch, which cannot be taught, enables the operation to be started in the most effective method and finished with the greatest accuracy.

When the output of munitions ceased women were being employed in practically every process of the industry—foundry, laboratory and chemical works. "In the filling shops, women's devotion to their work has been proved time and again. Whether the process undertaken be in company of a few comrades, or in isolated huts where lonely vigils are kept over stores of explosives, the munition girls are hardly known to flinch in their duty."

Then there were the W.A.A.C.'s who joined up, with high hopes, for service abroad. In their work was much versatility. Sometimes it was altogether thrill-

ling—attuned to the roar of guns and punctuated by the bursting of shrapnel. More often, though, their lives were of deadly monotony and French mud. Day after day for months on end they trudged from camp to office and office to camp, and they added up endless rows of figures and tapped the keys of the ubiquitous typewriter.

Women's sudden invasion of the industrial sphere was naturally the signal for an entirely new branch of organisation; that is Welfare Work. Lloyd George, then Minister of Munitions, explained the situation briefly thus: "The workers of to-day are the mothers of to-morrow. In a war of workshops the women of Britain are needed to save Britain; it is for Britain to protect them."

A Welfare and Health Department was immediately established and female candidates were put into training for supervision work. This work included the inspection of the supplies of protective clothing for the women workers; the selection of the workers themselves; the cleanliness, ventilation and warmth of the establishments; the provision of seating accommodation where practicable and the transfer of workers from one process to another.

The question of protective clothing in the munition factories required a deal of attention. Great tact was at times necessary in its introduction. The wearing of caps, for instance, was at first in disfavour, though in some sections it gave considerable immunity from accident. They did not achieve popularity in the eyes of the workers until, by insidious propaganda, they were considered to add *chic* to the wearers.

Canteens had to be established. Rest and first-aid rooms formed another consideration of the new *régime* and women police were introduced. These checked the entry of the women into the factories, examined passports and searched for such contraband as matches, cigarettes and alcohol. They also dealt with petty offences.

The important question of motherhood had to be considered and the factory nursery. Large numbers of soldiers' wives were making munitions and many a mother was enabled to offer her services on the opening of numerous well-appointed nurseries. Even during the night-shifts munition workers could claim accommodation for their children.

WIRELESS POSSIBILITIES

I.—ON THE HIGH SEAS

Especially Written for "Sea, Land and Air" by SANS FIL

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So many interesting reports have been published recently of the development and progress of wireless that a few articles from one closely associated with this work will be looked for by the readers of this journal.

To use a colloquial phrase, one might say that wireless is now "coming into its own." The immediate future is filled with so many possibilities which will affect every phase of life and activity that no one can afford to be ignorant of them.

The two or three thin antenna wires at the masthead of merchant ships and the squirrel cage arrangements on war vessels are now so familiar that they are scarcely noticed, while the value of wireless in life saving at sea is understood by everybody.

Before the war something between one and two thousand British merchant ships were equipped with wireless apparatus, while to-day the number is over four thousand. This section alone forms a vast organisation, employing five or six thousand young Britishers in a work which is aiding our commerce and protecting thousands of valuable lives and millions of pounds worth of treasure.

This organisation, though not so widely advertised, is more wonderful and useful than the renowned Ford motor car, because these vessels are fitted with one standard type of apparatus, the parts of which are interchangeable, and spares for which can be obtained in most of the principal seaports of the world, while the methods of control and training of operators are uniform throughout.

The day is rapidly approaching when no vessel, however small or relatively unimportant, will put to sea without a standard wireless equipment, and even ferry boats and other vessels navigating inland waters will find use for direct communication with the shore.

In addition to its use in protecting life and property at sea, a ship's wireless sta-

tion performs numerous other duties of importance. Navigation, out of sight of land, depends upon knowing the ship's position on the chart; that is, her latitude and longitude. Latitude can be found by observation of sun and stars, but to find longitude accurate Greenwich time must be known also. All ships carry chronometers for this purpose, but although better than any ordinary clock or watch, they are all subject to inaccuracy, and therefore, are not entirely reliable or perfect. In this, wireless has supplied the missing link, for any ship at sea in any part of the world can now get exact time by wireless at least once daily.

Weather conditions are another important matter at sea, and once more wireless aids the navigator by supplying weather reports, forecasts and warnings from other vessels and from the meteorological bureaux in all countries.

During the war all vessels received frequent "war warnings" of minefields, submarine haunts and raiders, while, both in war and peace, special warnings are given of dangers to navigation, such as derelicts, icebergs, typhoons and altered coastal lights.

Values in life saving and navigation alone are more than sufficient to justify wireless apparatus in ships, but its utility goes much further.

Every vessel with wireless apparatus is a "floating telegraph office," with all the necessary arrangements to send and receive public telegrams to and from all parts of the world. Many thousands of pounds are saved to shipowners alone through this service. Time of arrival or delays are known, and the cost of keeping large staffs waiting on wharves for expected vessels which do not arrive on time is saved. Coal and provisions can be made ready for a ship's call and save much valuable time in port. Irregular cargo vessels can be directed to

any port, and their destinations altered without the expense of bringing them into other ports for orders.

Through a complete international organisation the ship's telegraph office now forms part of the world's telegraph and cable system. Messages for people travelling by sea in a vessel equipped with Marconi apparatus can be sent from any one of the many thousands of inland telegraph offices in the world, and conversely a passenger can send a message from his ship at any time to any address in the world.

For instance, Mr. Jones, crossing from Sydney to Wellington in the *Riverina*, could send the following message, pay all the charges and know that in a few hours it would reach its destination, and no charge would be collected from the addressee:—

“From S.S. *Riverina*,

To Mrs. Jones,

Hotel Royale,

Vevey, Switzerland.

“Going New Zealand, thence San Francisco for London, feeling well. Love.—Jones.”

The Marconi operator in the *Riverina* would calculate all the charges from the *Riverina* to Vevey in Switzerland and collect the money from Mr. Jones. The message would be wirelessed to Australia and thence forwarded by cable and inland telegraph to Vevey.

In the same manner Mr. Smith, a business man travelling from Colombo to Fremantle in the *Khyber*, could telegraph valuable business information to his partner Mr. Robinson, half-way between London and New York in the s.s. *Baltic*.

The intricate and carefully planned organisation which places all the wireless stations, cables and land telegraphs of the world at the service of an individual passenger in a ship does not demand any thought from Mr. Jones or Mr. Smith, but if he gave the matter a thought he would certainly wonder how his message

would go through so many varied channels, and how the numerous wireless, cables and inland authorities would collect their portions of the charges from the wireless operator in a ship on the high seas. We have not enough space to describe that in this article, so we must leave Mr. Smith and Mr. Jones to talk it over with the operator after dinner in the smoking room.

Even with all this we have not completed the story with wireless in ships, for all the passenger liners crossing the North and South Atlantic Oceans have their daily newspaper published on board. While the passengers are fast asleep an operator sits at his instruments at midnight to receive the current news of the world from the special news distributing stations on each side of the Atlantic.

As fast as the news is received it is passed down to the editor, who prepares the copy for the printer. The morning paper is on sale by 7 a.m., and “subscribers’” copies are delivered by their bedroom stewards with the morning cup of tea and shaving water.

The latest international conditions, topical news, stock markets, sporting results and everything one reads in an ordinary newspaper on shore are placed before the passengers in an attractive and well-printed journal, which also reports local news from on board, and contains a selection of storiottes, leading articles and serials for lighter reading during the day. Ocean journalism has thus been brought to a fine art, and the day is not far distant when the same service will be provided in Australasian waters. By wearing a mask, frequent inoculation and avoidance of inhalation chambers, the writer hopes to keep a normal temperature, so that this series of articles may be continued until all the remarkable possibilities of wireless telegraphy and telephony over land and sea have been described.

One of the earliest victims of the influenza epidemic was Mr. H. J. Firth, Melbourne superintendent of the Marconi School of Wireless. After a long and critical illness, Mr. Firth, we are pleased to announce, is now making very satisfactory progress and is expected to complete his convalescence during the next few days.

Mr. A. M. Loewenthal, City representative of the A.M.P. Society, requests us to notify our readers that he may be seen at his offices, Perpetual Trustee Building, 33-39 Hunter Street, Sydney, from 9 a.m. to 5 p.m. (Saturdays, 9 a.m. until noon). His telephone numbers are City 1591 and Waverley 476, and a definite appointment should be made before calling.

THE NEW SHIPPING ERA

PRIVATE ENTERPRISE AND STATE NEEDS

We have re-discovered our Merchant Navy as a result of the war. If we henceforward keep it in remembrance, it may be the biggest result from a national point of view. Prior to 1914, people who consulted "Whitaker" or suchlike guides to useful knowledge, knew that the British Empire owned over half of the mercantile tonnage of the world, with Germany a bad, though dangerous, second. They had little idea, however, of the national significance of the fact. Shipping pools and rings, in which foreigners participated, such as the "Morganatic marriage," hid the importance of our position as the world's wagoners to our national life. At most it was recognised, thanks to the Tariff Reform controversy which gave the public a rudimentary idea of political economy, that the excess of imports over exports was adjusted by "services" rendered by this country, of which ocean carrying was the greatest and shipping freights the most fruitful return.

Moreover, the liner bulked too largely in the popular imagination. The *Olympics*, the *Mauretias* and the *Imperators*; the gilt and plate glass; the "Blue riband of the Atlantic," were the things written up as if they chiefly mattered. Few people realised that the day was coming in which our very existence would depend upon "the little cargo-boats which sail the wet seas round," manned by the ill-paid, un-uniformed men, of the Ratcliffe Highway and the forlorn streets which line the Mersey banks. In popular belief the British "shell-back" was almost extinct and his place had been taken by Dutchmen, Dagos and Lascars, who, the owners insisted, were indispensable because cheaper and more sober. Thus it appeared to many, even to some with at least a partial knowledge of the facts, that the Merchant Navy was international rather than national, a producer of wealth to British traders, undoubtedly, but no longer, as it had been in the past, a part, and no mean part, of the "sure shield" of Britain.

The war changed the picture com-

pletely and at once. The international cloak slipped off at the first call to national service. The Dutchmen and Dagos went. The British merchant seaman joined the fighting Navy in his thousands, and yet thousands more appeared to fight the grimmest battle ever fought by man against the deadly foe which lurked unseen. Thousands of the best and newest ships were taken over for military service; hundreds more were sent to the bottom. But, by some magic which Sir Joseph Maclay will, no doubt, reveal in time, more ships were found to take the place of the lost. There were astonishing resurrections of ancient craft. Anything whose plates would hold together and her engines turn was pressed into the service to bring the commodities without which we could not live or fight. The story of the *Bolivar* was repeated every day. The stubborn grit of the seamen, working, not for owners' profits, but for the safety of the nation, performed this, the miracle of the war. The true facts must be recorded. It is to the heroism of Mercantile Jack, but also to the forethought and sound policy of the kings of the shipping world, that we owe our escape from the City of Destruction and our toilsome but happy progress to the Beulah of victory and peace.

The fact that the miracle of the merchant navy was wrought under Government control has led certain persons to insist that the control should be continued and extended until, at last, it be converted into complete nationalisation of the shipping industry. That, we are persuaded, is a false policy. The whole history of sea-going, from the days of the Phœnician traders up to now, is a history of private enterprise, of great risks taken for great rewards. "Subsistence industry" and "subsistence husbandry" there has been on land. There has never been anything of the kind at sea. The nearest approach to a national merchant navy was that of Venice in the years of her pride. But Venice was then a State practically without agriculture and without

other industry but that of sea-transport and fisheries. Her peculiar status can, in any case, form no precedent. The Dutch actually built up their supremacy in the carrying trade while they were in revolt against their lawful sovereign and his Government. In these two instances of maritime oligarchy, the owners of shipping were the Government, which is a vastly different thing from the Government being the owners of shipping. In later experience, from Colbert to Herr Ballin, Government aid in the shape of subsidies has nowhere succeeded in building up a mercantile marine on sound lines where there was not a national bent in the nation towards maritime enterprise.

We are, then, by no means prepared to fly in the face of history and experience and play pranks with the key of all key industries. None of the arguments—whatever weight we attach to them—in favour of the nationalisation of railways or mines are really applicable to shipping. "Freedom of the Seas" implies that any individual or body of individuals who can acquire a hull and engines and find men to work them should be as free to use the seas as the Governments of the nations, always provided that the equal right of others is not interfered with. And the freer the use the better for the nation. So we may welcome the news that restrictions on the production and working of merchant shipping are to be removed as soon and as far as possible, and that private enterprise will be allowed to reassert itself in the task of bringing food and the raw materials of industry to this country in the largest quantities obtainable. We wish that all restrictions could be removed. But that is, for the time being, impossible. Europe has to be restored to a stable condition, and the available resources of the world must be made to go round by some system of fair distribution. It is in order that this may be secured that the Allies have insisted upon taking over the German ships as one of the conditions of the renewed armistice. It would be in every way bad, both for the service and for the world, if British shipping did not play a part in this work commensurate with the premier position it holds. There must, therefore, be a continuance of Government direction and of the inter-allied pooling arrangement for some time longer. Sir Joseph Maclay has told us so plainly.

We can fully understand that the shipping interests chafe under these necessary inhibitions. The United States have reappeared as a serious competitor for the future primacy, and the desire so to direct tonnage that British carrying trade may be re-established with ports which have had to be abandoned under stress of the submarine warfare is only natural. We see no reason, however, either for impatience or alarm. The shipping trade will follow in the future the laws which it has followed in the past. The United States is not a new competitor. Prior to the Civil War, American shipping was second only to our own. They let their chance slip through their fingers owing to their preoccupation with the development of the internal resources of their country. If the natural causes then working have ceased to operate, they may renew the bid with every prospect of success. But the causes which gave us the primacy have certainly not ceased to operate so far as this country is concerned, and as the war has just given evidence of intense vigour in our population, especially in matters connected with the sea, we can find no reason whatever for serious fear of America or any other competitor.

With the elimination, for years to come, at any rate, of the mercantile marines of Germany and Austria—though the latter was never large—and the immense prospects of new trade opened up by the delivery of Palestine, Syria and Mesopotamia from the Turk; with East and Central Africa in a state of stable peace and ripe for development, the world can absorb as much tonnage as even Great Britain and America can put out and work between them. That there may be something of a war of freights is probable; but, in the long run, we may rest confident that the nation with centuries of maritime experience behind it will hold its pride of place, and it can very well afford a generous welcome to a "kindred nation" which has a proper claim to a greater share in the benefits of sea trade than it has secured during the last generation or so.

According to *The Observer* the task which lies before us is threefold: First to increase the output of our shipyards to the utmost extent of their capacity and of the national need. Secondly, to secure the utmost freedom of trade in all parts of the world and for all nations. Thirdly, to in-

sist on the merchant seaman's calling being recognised and rewarded as it deserves. His welfare has been left far too much in the past to the care of private associations, both as regards training and protection from land-sharks, in home and foreign ports. He should be treated in future as what he is: a most important part of the fabric of the national weal and security. In all these respects Government interest must continue to be displayed even after Government control has ceased. And Government resources must be available for the support of the Merchant Navy, not on the old pernicious plan of subsidies, but by aid which contributes to efficiency. If, when all is done that can be done, the need of the world for tonnage is greater than we can supply, then we should be dogs-in-the-manger if we grudged to another nation a share even greater than our own.

But we have no fear on this point. The

British nation has the root of the matter in it as has no other nation in the world. It is more vitally interested in the fullest possible development of sea communications than any other, and it has resources, both in its own products and in facilities for transit, which no other can match. Only wild Bolshevik folly, or something akin thereto, can deprive us of our capacity to hold our place at sea against any other nation in the world. We have a difficult corner to turn at the moment, no doubt, and the fact should be impressed on the public mind. We must resist the blind desire to take a leap in the dark by nationalising everything, and equally the narrow individualism which looks to nothing but personal profit. We have awakened to a proper pride in our Merchant Navy, and that is the best guarantee for its future. The British spirit will never let down anything which it feels to be part and parcel of itself.

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(Continued From April Issue)

PART II.

We descended into Broadway, crossed the beautiful concrete road, and reached the stairs beneath the viaduct. Here further progress was blocked by revolving, non-reversible turnstiles, marked ENTER and EXIT. Stacey handed me a bronze coin, the size of an old farthing, placed a similar one in a glass slot, and pushed through, followed by myself.

We emerged upon the fixed central strip, and faced the moving platform, gliding towards the Quay at about three miles an hour. Stacey took my arm. "Step!" he commanded, and I found myself on the way. I noticed several persons looking at us. "Country visitors sometimes lose their footing at the first attempt," explained my companion, "but town children run about all over them." Two more "steps" landed us on the outer ways, travelling, I estimated, at not less than ten miles an hour. We seated ourselves, and prepared to enjoy all Broadway below us.

"How is this done without noise or vibration?" I asked Stacey.

"This floor," said he, stamping his foot, "is really the deck of a shallow boat, carried along by a thin layer of water which rushes beneath it."

I noted the magnificent shops, with upper and lower windows, the upper ones on a level with our seat. The footways were twenty feet wide. I noted also that brass arrows were let into the surfaces to direct the traffic.

We crossed Market Street and then King Street, which had, somehow, become a level stretch from Elizabeth Street to York Street. We stepped off the travelling ways at Moore Street. On emerging from the turnstile beneath the viaduct I saw that Moore Street now ran right through into the Domain, and that Martin Place was some twenty feet below Broadway.

Stacey piloted me into a branch of the Commonwealth Bank hereabouts, and, without delay, into a manager's room. The

official listened to Stacey's rapid introduction, and at once became animated.

"We are very glad indeed to see you, Mr. Chatterton; I have often wondered when you would awaken. The possibilities of your estate have given us great interest, and sometimes cause for speculation. Yes, of course. Would you mind writing your usual signature on this slip, Mr. Chatterton? Thank you." He placed it in a pneumatic carrier, and dropped the latter into one of a row of throats at his side. "Of course, Dr. Stacey's identification is sufficient, but we must observe the customary formalities. I fear the country is sadly in need of rain just now."

The carrier plopped out of the throat again. He opened it. "The reports from the interior are very depressing. Remarkable!" he ejaculated, closely scrutinising the two slips of paper which it contained; "signature absolutely identical after seventy years' interval. There will be no trouble, Mr. Chatterton, no trouble at all; you may have a cheque-book at once."

"Thank you, but how does my account stand?" I inquired.

"That," he announced, "is a very difficult question; we have a very large sum to your credit; I hardly like to say how much—you know how money multiplies itself at compound interest—and in your day, and for some time after, interest *was* interest—five to fifteen per cent., I have read—very different from the half or quarter per cent. we are restricted to now-a-days. However, the Public Trustee, under that atrocious Macintyre Act, which restricts all accumulating, some years ago entered a caveat and the estate will probably have to be brought into Court. But as your rents obviously are yours now that you have happily come to life again, you are at least comfortably off. I trust you will continue to keep your account at this branch? Thank you, and good-day."

Over the counter the paying teller took

my cheque and asked, in the old pleasant way: "How will you take it?" He was not at all busy, so remembering Stacey's farthings I said:

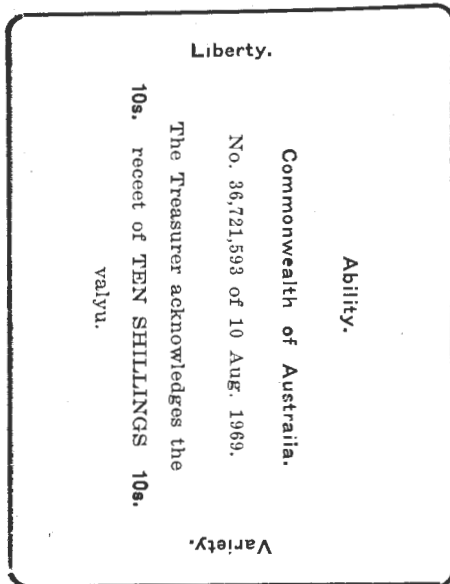
"I should like a sample of every coin you have, please."

"This gentleman," interjected my companion, "is a stranger, and not very clear about our values yet."

"Perfectly simple," smiled the cashier. "Here is the penny," he handed out to me the bronze coin which I had mistaken for a farthing, "the most useful one of the lot; five of them make a groat"—here he pushed over a nickel coin resembling a six-penny piece—two groats make the silver shilling, and two shillings make a florin." The last two coins, at any rate, had not altered much in appearance, though they seemed slightly smaller than when I had last handled them.

"What next?" I asked.

"Those are all the coins," he said. "Here is the ten-shilling note," he flicked over a translucent card with rounded corners, about the size of a visiting card, stiff, and engraved all over in fine tracery, "and here we have the pound note." This was of the old, limp kind, but in size no larger than an ordinary playing card, and in appearance something like this:—



"Also," continued the smiling cashier, "we have fives and fifties and hundred-pound notes, a few for a thousand, all in different colours, almost any colour you

like to ask for. People use the ten-shilling notes more than anything else; they fit into these little cases, so at a glance you can see how many you have. Of course there are ten pence in a shilling and two hundred pence in a pound."

"What has become of the golden sovereign, the bed-rock of the system?" I asked as I gathered up the little notes.

"Never heard of them," said the cashier. "I believe they have gold coins in some of the more backward and savage countries, where a man has to gather up his assets every now and then and fly for his life, but you could not pass them here, you know."

"Thank you, many thanks; it is extremely interesting."

"Got all you want?" asked Stacey. "lunch time now; come along."

We lunched in a kind of spacious cathedral on the corner of Broadway and Hunter Street. This cross street, I noticed, rose slightly in the eastern direction, and terminated amongst the flower-beds of the Domain. Its western arm to George Street was quite level.

Stacey explained that Old Hunter Street lay beneath it, and that a similar scheme had been carried out for King Street. Pitt Street still ran beneath the western side of Broadway. "But people don't go into those old streets now; there is nothing to see there but basements and sewer pipes."

We were waited on by beautiful girls in gold satin kilts and sandals, and we ate strange, spiced foods, and drank effervescent iced drinks. Far below us, along Broadway, the procession of motor and pedestrian traffic was continuous, and the gay colours of the costumes flickered in the bright sunshine like jockeys' jackets on a racecourse. What was lacking? Nothing, yet something was absent. Ah! I remembered at last.

"Stacey," I said, "where are all the horses to-day?"

"Well," replied he reflectively, "I believe there are a couple at the Taronga Zoo, and ordinarily there are a few to be seen grazing in Moore Park, but what on earth do you want them for?"

"I mean, in the streets?"

Stacey laughed aloud. "You funny old man," said he, "don't you understand they were prohibited in Sydney streets years and years ago, after the Great

Plague, I think; anyhow, long before I was born. Very dangerous, and almost useless in a city, I should imagine. But they have a race-course, with daily races, in the island of Tasmania; they run them for Tattersall's Sweeps. Worth seeing, they say, once in a life-time. Are you going to sit there all day, or are you ready for the Inner Circle?"

"Let us fly, by all means," I agreed eagerly.

We descended swiftly into Broadway by the lift—there seemed to be as much vertical as horizontal movement in this New Sydney—and decided to walk the short distance to the Quay.

To my surprise Broadway ended, where I expected to find Circular Quay, in a large, open park, with the viaduct of moving ways traversing it.

"How's this?" I demanded; "where's the Quay?"

"The Quay? It runs from Dawe's Point to just off Lady Macquarie's Chair," he replied nonchalantly; "this bay has all been filled in since your time."

We followed the moving ways across the park to the water-front. Here they delivered passengers to the top decks of ferry steamers, fast thousand-ton turbine boats, which berthed themselves almost automatically. My attention had long before been drawn to an enormous statue, some three hundred feet high, perhaps more, which I now perceived rose sheer from the waves where used to be Fort Denison Island.

"What in the name of fortune is that thing, Stacey?" I asked.

"Memorial of Burke, first President of All the Australias,—Facing the Dawn," he quoted glibly. "The thing he's holding up is The Circle; but you don't catch it well from here; you should be off the Heads to see it properly. It is intended to represent The Unity, as against the old crosses, stars, stripes, crescents and trinities, which all implied something at cross-purposes."

We turned and resumed our stroll. Where lower George Street used to be, an immense structure now reared itself from the park, at least two hundred feet into the air. Its frontage revealed a dozen large entrances, with signs aloft, reading: Inner Circle, Narrabeen, Hornsby, Castle Hill, Parramatta, besides others, in the distance, not discernible.

"Central Air Stage," said Stacey. We walked towards this monstrous flat-topped hill of concrete, and paused at the first entrance, Inner Circle.

"Or would you prefer any other run?" he suggested.

"No, this one will do splendidly."

We found ourselves in a long, wide passage, lined with opal tiles. A notice attracted me, and we stopped to read:—

AIR DEPT.	
Inner Circle East.	
8 Minutes—Fare, 2d.	
Central to The Gap, 2 min.	} and Reverse.
Central to Bellevue, 3 min.	
Central to Randwick, 5 min.	
Central to Moore Park, 6 min.	
Central to Central, 8 min.	
Ariels leave Central at the hour and at intervals of 10 minutes, morning and afternoon; at 15 minutes' intervals evening, and half-hourly intervals night.	

We were stopped by the usual turnstiles, which admitted us on dropping coins into their funnels, and we followed the passage, apparently into the bowels of what had once been Observatory Hill. At the end a turn to the left landed us on a travelling stair. Up we went, twenty feet at a time on the slope, then a few feet on a level, and so on, until at length we emerged on the flat roof of the stage.

What a scene! This roof was two thousand feet long, over a thousand feet wide, and carried berths for twenty or thirty Ariels. The dock we were in was vacant, but Stacey pointed out our vessel, rushing towards us at a terrific pace from the direction of the Moore Park stage. Even as he spoke the huge planes overshadowed us, the machine grounded on its springs, the side-doors were simultaneously slid aft, and thirty or forty passengers bustled out and made for the descending stairway.

"Hop in!" said Stacey, "they don't wait." In about the time it takes to stop and start a tram the doors were slid shut again, and we were off!

The car was divided, I perceived, down the centre, by wire-nettings between the lattice of the central skeleton, and there were only two seats on each side of the netting, so, once in, we had to remain where we were. I counted forty rows of

seats, so our vessel could carry a hundred and sixty people.

The crew apparently consisted of the pilot in a little glass compartment up for'ard, and an engineer on a central platform overhead; presumably the engines were concealed up there also.

A notice on the netting drew my eye—

PASSENGERS ARE FORBIDDEN TO THRO
ANYTHING OUT OF THE WINDOS.

Of course I looked out of the barred window—and felt violently sick. Garden Island lay a long distance below me. Stacey grasped my wrist. "Don't look down yet, you are not used to it; look right ahead at the Gap." I shifted my fascinated gaze, and at once lost that horrible sensation. The landing stage at the Gap stood up square-topped above Watson's Bay; already it was visible in detail, we must therefore be travelling towards it at an enormous speed.

Just then all the windows on our side of the car closed with a snap, while, simultaneously, all those on the other side opened. "Changing course," explained Stacey.

"What caused the windows to shut?" I asked.

"Wind pressure, of course; we should be blown off our seats if it could get at us," he replied; "we're doing three hundred miles an hour, at the very least."

The Gap Stage now appeared quite close, and much higher than our own altitude. "Suppose we struck it, Stacey? I mean, we seem too low." He smiled. "Never heard of an accident like that yet; they have a little propeller up aloft that takes care of all that. See!"

Even as he spoke the Gap Stage floated quietly down beneath us, and we stopped. The pilot had only made, I could swear, a couple of trivial motions with his right hand among some wheels and levers. The side-doors slid apart, passengers got in and out, the doors snapped to again, we were off, and lo! the ocean was beneath us.

This time a downward glance did not embarrass me.

"If you like," suggested my guide, "we can get off at the next stage, Bellevue Hill; and tram home."

"Not for anything," I protested. "I

am just beginning to enjoy myself thoroughly."

"Or we could change at Randwick for Cronulla, and get on to the Outer Circle, if you'd care for a longer run," he added.

"The very thing! Outer Circle by all means." I replied, "I feel as if I could never have enough of this."

So we did. Across Botany Bay, or Portobello, crowded with shipping, we flew to Cronulla, and thence over many stages whose names I forget; Como, Guildford, Parramatta, were some of them. At Guildford we stopped for a moment, and here I noticed a large, garish Ariel, anchored on the stage. Along its side, in gilt letters six feet high, was the sign

STRALIA.

Seven unequal gold stars were patterned on the undersides of its planes.

"What fine bird is that?" I asked.

"That," explained my companion, "is the Parliamentary Ariel which runs to Stralia every night."

"Stralia?" where's that?" I inquired.

"Stralia, capital of Australia, of course, centre of the continent," he replied, "about twelve hundred miles equi-distant from Perth, Port Darwin, Brisbane, Sydney, Melbourne and Adelaide. A flier she is; does the trip in three and a half hours, and gets there in ample time for breakfast. It is said that some of our delegates sleep half their time on her; most luxurious fittings, but the public is not allowed on board. A lovely cool trip on a hot summer night."

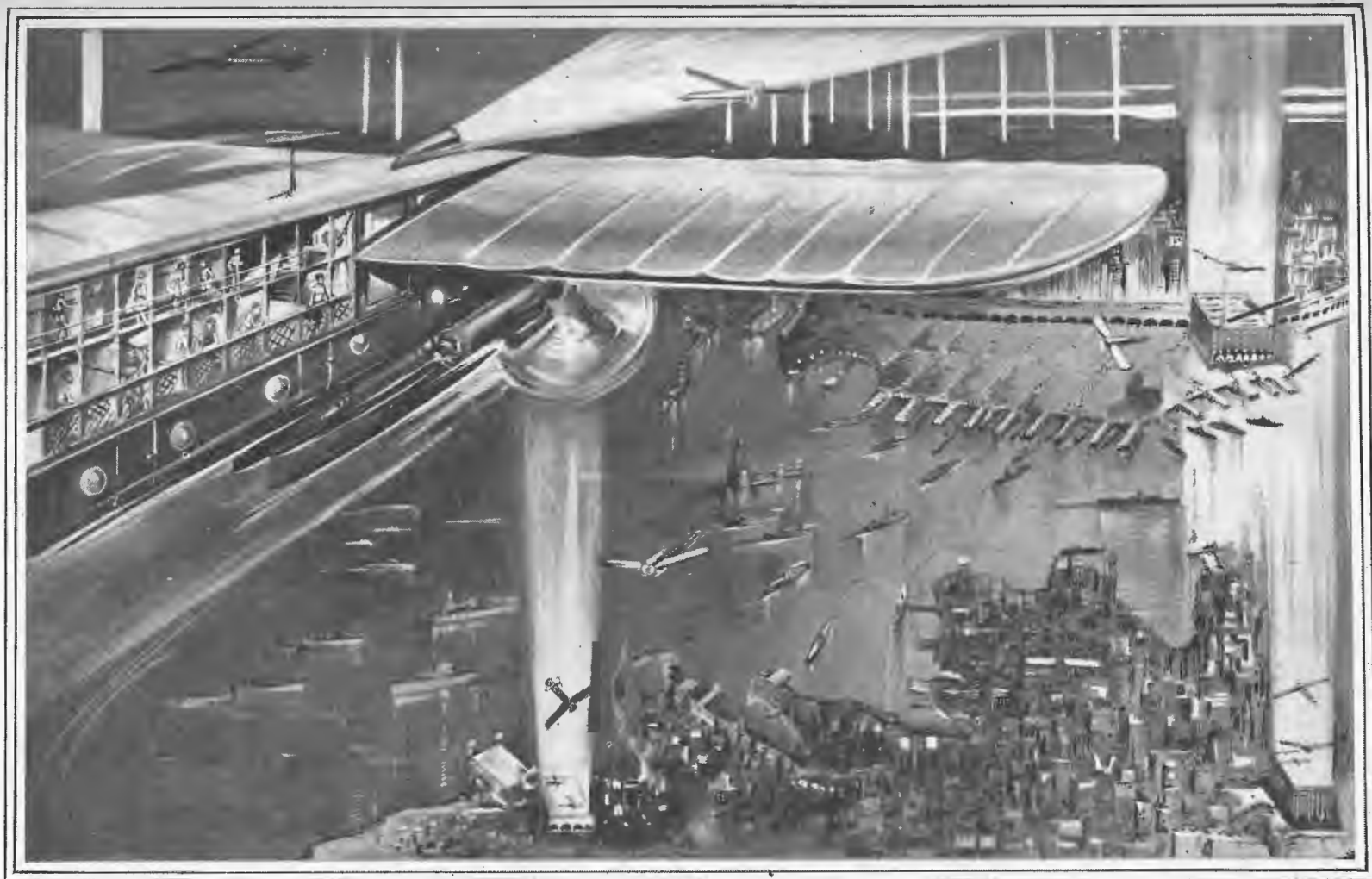
On the Hornsby stage was a very large Ariel, with accommodation, I should think, for four or five hundred passengers. Along its side ran the inscription *NUXLE & BRISBN XPRES, which for a few seconds puzzled me.

At Narrabeen we descended from the high stage, and came into a Garden City, with rivers, lakes, islands, bridges, lawns, beaches and pavilions. Here we walked, till dusk, among gay crowds of people bent on holidaying.

We flashed home from Narrabeen to Central in four minutes, over a darkening city studded with brilliant spots of light. On our right and left as we flew blazed the vertical beams of revolving coloured lights, marking the Crow's Nest and Mosman stages with pillars of fire.

My eyes had become weary of encoun-

* Presumably Newcastle.—Ed.



The City of Sydney, A.D. 1971.
We flashed home from Narrabeen to Central in four minutes.

[See preceding page.]

tering so many new and surprising things, and I was so tired that night that Stacey assisted me into bed and I had sunk into a deep sleep before he left the room.

* * * *

A MORNING WITH MR. GRYPE, THE CITY ENGINEER.

Next morning broke bright and clear; another hot summer day. I sprang from bed, feeling exceedingly well, and became aware that the wireless telephone was ringing persistently.

"That you?" came Stacey's familiar voice, "you were very sound asleep. Feeling all right, I suppose? Now listen. I have to go to Waterfall Hospital this minute—big case, can't avoid it, sorry—so I've asked Gryme, the City Engineer, great friend of mine, to look after you for an hour or so this morning. Go to his office; see you later." The instrument rang off.

I leisurely dressed and reflected, for the thousandth time in my life, that nearly every morning in Sydney was perfect.

I went out into Macleay Street, where the north-easter was just commencing to stir the hot rays of the sun. A gentleman in a blue Chidley rig, with the letters S.C.C. embroidered on his sleeve, and holding in his hand a turnkey and a small bell, was the only person visible on my side of the road. He halted before an iron plate let into the concrete pavement, inserted his key, glanced quickly up and down the road, and rang his bell. Then, for two hundred feet on either side, jets of water gushed forth from the face of the kerb, and across the road to the central slot. In about twenty seconds the roadway was watered, the official withdrew his key, and marched on.

I recalled the fact that two days ago—no, of course, it was fifty years ago, I had seen a wooden barrel, drawn by a horse, painfully dripping a spasmodic trickle of water as it crawled along.

At the towering Café Havilah, on the Darlinghurst Road corner, I found breakfast. Fruit, fish, wine and coffee were served to me, and the charge was one shilling. The lady at the cash-desk condescended to talk with me, and from her I learned that all fish was supplied by the State at the uniform rate of one penny per pound, and that no one was permitted to charge more than a shilling for breakfast. Cigars cost one penny each, irrespective

of size, strength or aroma. She displayed some twenty varieties of cigars this morning, but had never heard of cigarettes or pipes, and evidently began to suspect me of bantering her.

I lit the penny cigar, and found it exquisite, as had been the breakfast. The green and gold tram stopped at the door, I boarded it, and was rapidly carried to Hyde Park. The car finished its short, swift career on a loop below the Broadway viaduct, and most of the passengers made for the stairs.

Waiting on the reverse loop was another car, labelled PYRMNT. Evidently Broadway was the backbone of Sydney, and the tramways its ribs. Remembering the devilish, Chinese malformation of a system now vanished, I thanked my stars that I had slept so long.

Not very sure of my way in this new and startling city, I continued along Park Street towards George Street. Park Street was now at least a hundred feet wide, with pavements twenty feet wide, roofed in with arched concrete verandahs. A very large gentleman in a grey suit, equipped with a belt, some kind of side-arm, and worked on his tunic a large gilt star enclosing an eye, moved sedately along. The gait could not be mistaken—a policeman, of course!

"Can you direct me to the City Engineer's Office, please?" I inquired.

"Sure, ye are nearly there now; keep on this side, across George Street, and into the Victoria Building," he directed.

As I turned suddenly into George Street I became aware of further vast changes. Where had stood the old Cathedral was now a twenty-storey structure of concrete with CITY HALL engraved into its front. Alongside was a small, quaint, archaic building with the bewildering word THE-ETTA, in gilt lettering, on its *façade*. After considerable difficulty I decided that this must be the old Town Hall, with its portico railings and some other excrescences removed, and the whole converted into a theatre.

The Victoria Building was but slightly altered. There was no tramway in George Street, and the centre of the square was enlivened by bright flower-beds and by three large fountains, throwing up huge columns of water, which danced and sparkled some fifty feet into the air.

Opposite the City Hall the whole side

of the square was filled by tall buildings. At the corner of Park Street I noticed that the first block was occupied by the City Treasurer, the next by the City Secretary, and the southern by the City Engineer. As I crossed over I found myself regarding a large bronze group some thirty feet high, representing two soldiers and a machine gun, perhaps three times life size, and an inscription on its trachyte base referring to Gallipoli, Pozières, Gaza, Bullecourt, Le Mouquet and other battlegrounds, which, to me at any rate, were distinctly familiar.

Mr. Gryme received me in a large room hung with maps—a great many maps.

"Only too glad to do anything for a friend of Dr. Stacey," he genially said, "especially as you remember Sydney before I was born. It must be a curious sensation to see things in two stages at once, so to speak. I have often tried to imagine what Sydney was like in your time, but I find it very difficult to see Darling Harbour before it was filled up, or Observatory Hill before it was covered in. The old plans and sections are very poor and incomplete. But what would you like to see first, Mr. Chatterton?"

I intimated that I would look at some of the maps, and turned to the largest and cleanest, dated 1970. Close alongside was a dingy little thing, labelled 1837.

"You will find those two maps rather different," commented Gryme.

They were very different, indeed. On the old map Sydney appeared as a narrow strip of streets from Circular Quay to Brickfield Hill, the rest was blank, except for encrusted dirt. On the modern map the city area proper was bounded on the north by Port Jackson, on the east by the ocean, on the south by Cooks River, and westerly by Summer Hill. North-east and north-west divisions were separated by Lane Cove River; the western division lay between the Parramatta and Georges Rivers, and another division below Georges River was labelled "south-west."

"This represents," explained Gryme, "all the thickly populated area, but there are detached houses now all the way to Wollongong, Picton, Springwood, Kurrajong and Gosford, so Sydney and suburbs form a semi-circle of about thirty-five miles radius."

"Where does all that water come from?" I asked, pondering the unceasing flow of the three huge fountains in the square be-

low, and recalling the scanty and precious supply in the early years of the century. "There are millions and millions of gallons running to waste out there."

"Not to waste, my dear sir, our Water Commission wastes nothing. That water you see is used in the lower levels of the city, it is only, so to speak, being aerated there. We have similar fountains in all the higher sections of the city, Hyde Park, the Domain, Bellevue, and all over North Shore. The central one out there is illuminated at night when the theatre is open."

"But the cost of pumping?" I objected, remembering, with some effort, certain ancient statistics, now very 'musty' indeed.

"Pumping, did you say?" He smiled. "There is no pumping. Part of the supply comes from Cataract Dam through six-foot mains, under high pressure, nine hundred feet head, I think. The catchment now extends to Goulburn and Mount Victoria; if I mistake not, about half the Hawkesbury has also been tapped. Even in my time, during the past fifteen years, the expansion of Sydney has been phenomenal; what must it appear to you after fifty years, Mr. Chatterton?"

"That's just my difficulty. The whole thing is so vast that I hardly know where to begin. If you could kindly point out on this map of yours the chief alterations—of course I have had a half day on the Ariels—it would be a great help to me."

"Certainly, delighted, the very thing. Here we are. The most important alteration within my personal recollection was the filling up of Old Darling Harbour, which cut the city in a most awkward manner. Pyrmont Bridge was then raised level with Sussex Street, next came the building of the Druiitt Street bridge. The goods yards are under the bridges, and electric cranes hoist the merchandise direct from the trucks and drop them into motor-lorries waiting on the bridge above. Then the Rose Bay wharves, with sixty feet of water, to take the 100,000 tonners, were built; the goods trains, as you see, run on to the wharves. Filling up Circular Quay was another great scheme; they did that with material excavated from the underground tunnels. There is one thing which you should not miss, particularly if you are a fisherman; the island here, in old Farm Cove, now called Park Lake. You go down below sea level and look at the fish through

plate-glass windows; the finest salt water aquarium in the world, it is said. Here, you see, we have a road connecting Potts Point with Garden Island; we have a large plant there for producing ice from seawater."

"What?" I interrupted, "where is our naval base then?"

"All the naval business was removed to Port Stephens and Jervis Bay many years ago."

"And Cockatoo Island?"

"There is also a roadway; this is it, connecting with Balmain. The Harbour Commission builds ferry steamers there now. And, as you see here, there is now a large island where the old "Sow and Pigs" used to lie in the harbour entrance, the pilots of the Aerial Customs Service are housed on it. There are also some new deep-sea wharves at Clontarf, not shown on this plan yet. I think that is about all that has been done in Port Jackson to date. But at Portobello, old Botany Bay, you know, we have —"

"Stop! you leave me breathless," I gasped, "where is the North Shore bridge?"

"Tunnel, you mean," he corrected; "it runs from Dawe's Point to Milson's Point; here, these dotted lines on the plan. Visitors from the remote interior sometimes persuade the guards of the goods trains to let them travel with them beneath the harbour, but it is not a popular trip. The ventilation of tunnels in this climate is still not perfectly understood, and is inclined to be hazardous and uncertain. People have grown accustomed to the fresh blow of the Ariels.

"When, a few years ago, it was proposed to provide a tunnel for motorists, the outcry was so fierce that the project had to be relinquished. North Shore, you know, is entirely residential; no factories or warehouses are permitted in that district. The city area is reserved for shops and offices, except on the coast side, which, like the North Shore, is residential. All the large

warehouses are situated around Portobello, and the factories are mostly in the Western Division. A large number of artisans live in the city and 'plane out to the factories in the suburbs every morning."

"The air seems very good here," I remarked, mentally contrasting it with the warm, dust-laden fogs which formerly infested this part of the city each summer, "and I have noticed neither noise nor dirt."

"Well, the immediate vicinity of George Street is considered rather a back-water at present; we exhibit it to visitors as a relic of the good old times. Of course, there is no dirt or dust, see that vacuum cleaner down there."

A motor vehicle, almost as large as a pantehnicon, was slowly skirting the fountains. It trailed a wide rubber lip behind it. There appeared to be nothing on the beautiful green roadway for it to pick up, but the green colour was more brilliant after it had passed.

"We have over a hundred of those cleaners," said Gryme, "and they take up nearly two hundred tons of minute particles every day; where the dust comes from is one of the problems which continue to baffle shrewder brains than mine; out of the air, I suppose."

"And what becomes of the dust they pick up?"

"Burnt, and helps to make our finest class of concrete."

"Any trouble with garbage and the destructors now?" I asked, remembering the unspeakable plants and futile controversies of ages past.

"Garbage? Ah! I comprehend. There is none now. Every house has its own electric incinerator in the basement, supplied with enough current to melt metals. The clinker goes down the sewers and out to sea. But I can give you half-an-hour in my car, and then you may see for yourself anything you are specially interested in."

[A further instalment will appear in our next issue.—Ed.]

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AUSTRALIAN AERO CLUB

BRANCH TO BE FORMED IN NEW SOUTH WALES

While the current issue of this journal was already in the Press the following letter reached us from the Honorary Secretary of the Australian Aero Club, Melbourne:—

To the Editor,

Sea, Land and Air.

Dear Sir,

N.S.W. SECTION AUSTRALIAN AERO CLUB.

At a meeting of the Committee held last night it was decided that your request to form a New South Wales Section should be granted under the following conditions:—

That the N.S.W. Section will comply in all respects with the existing rules of the Australian Aero Club, and with any additional rules that may from time to time be issued by the Club.

That the Committee of your Club consist of a majority of pilot members in accordance with the Club Rules.

That this Committee will carry out all the functions of the controlling body of the N.S.W. Section, including the election of members, with the following exceptions:—They will not handle the financial portion of the Club, as it is deemed advisable, at the present stage, that this should be handled by the Honorary Secretary at Melbourne. This means that all remittances from your Section will be forwarded to me, and all accounts certified by your Committee as correct will be paid by me.

Further, your Committee has no authority to issue Aviators' Certificates or to carry out the functions of the Aero Club in the control of Sporting Events, except where specially authorised in writing by the General Committee.

I would be much obliged if you would proceed with the formation of the Club as quickly as possible, and any assistance which we can render you in Melbourne we shall be only too pleased to offer on hearing further from you.

Yours faithfully,

H. J. SLEEMAN, Hon., Sec.,

Australian Aero Club.

The Australian Aero Club is affiliated with the Royal Aero Club of the United Kingdom, and with the *Fédération Aéronautique Internationale*. It is the recognised authority on all matters pertaining to aviation and is the sole body in Australia empowered to issue certificates to aviators.

The headquarters of the New South Wales Section will be in Sydney, and fuller particulars will be published in these columns as soon as suitable Club premises have been decided upon. The new Club will doubtless soon become a recognised rendezvous for returned members of the Australian Flying Corps, and also of civilians interested in the subject of commercial aviation. Meetings will be held at frequent intervals and a programme of interesting lectures and debates arranged at the earliest possible moment.

No entrance fee is required, but all applications for membership must be accompanied by a cheque for one guinea, in payment of annual subscription.

Application forms and book of rules will be forwarded to *bona fide* inquirers.

All correspondence relating to the Club should be addressed to:—

Mr. Edward J. Hart,

Honorary Organising Secretary,

The Australian Aero Club,

Box 2516, G.P.O., Sydney.

Residents of New South Wales who are already members of the Australian Aero Club in Melbourne, will automatically become members of the Sydney Club, and *vice versa*, while members of the latter will enjoy similar privileges when visiting Melbourne.

It is expected that an inaugural meeting and election of administrative committee and office bearers will take place during the next few days. The proceedings will be fully reported in the June issue of this journal.

AVIATION

New South Wales School of Aviation, Richmond

Hitherto the facilities of the New South Wales School of Aviation at Richmond have been utilised solely for the training of Pilots for war purposes. The need for these has passed with the suspension of hostilities. It has now become possible to train men who are interested in Aviation privately or wish to engage in it commercially. It has, therefore, been decided that for the future the Aviation School shall be carried on as a branch school of the Technical Education Department, providing two separate courses of instruction—one for Pilots and the other for Mechanics.

The course of training for Pilots will cover a period of not more than 13 weeks, and students will receive practical instruction in flying, the principles of aviation, and practical instruction in adjustments.

The Mechanics' course has been specially designed for those who are gaining experience in one or other of the various trades connected with engineering or wood-working, and who wish to become aviation mechanics. These students will be given instruction in the adjustment and maintenance of aeroplanes and will have special instruction in engine work and rigging.

The Mechanics' course will be carried on so as to enable students to get the instruction by either attending on two week afternoons or for a full day on Saturdays, the latter provision being intended to meet the special case of apprentices who can get off from their work on Saturday mornings. The latter course will commence at 10.45 a.m. and will last till 5 p.m., and the afternoon courses will be from 2.30 to 6 p.m. in Summer and 2.30 to 5 p.m. in the Winter. All these times have been made to suit Railway time-tables.

Persons desirous of availing themselves of either of these courses of instruction should apply to the Superintendent, Technical College, Ultimo, where full particulars as to fees, etc., may be obtained.

(3B48)

JAMES NANGLE,
Superintendent of Technical Education.

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OUR QUESTION BOX

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.

ANSWERS

To "Argument," Camperdown and "Austrian," Melbourne. Replies to your questions cannot be given because your letters do not give your name and address.

K. C. B. Randle, Melbourne.—(1) The type of valve shown in your sketch is a 2-electrode device known as the Fleming valve—not an "Audion," the latter being an American trade name for what is generally known in British wireless circles as the 3-electrode or magnifying valve. The latest types operate on plate voltages of 100 or more, and are obtainable from Amalgamated Wireless (Australasia) Limited. The Fleming, or 2-electrode valve, also obtainable from this Company, operates on about 6 volts, but its cost is comparatively high, and beyond the means of the average experimenter. The above devices are patented and fully protected.

(2) The conditions under which apparatus were restored to wireless experimenters were printed in our last issue.

Sparker, Capetown.—If we knew your address the alleged verses would be returned to you. Your fellow-readers shall pass judgment on the last four lines:—

For as other sparkers do know when
The lightning doth show,
It is likely to make a great render
In his cabin.

E. T. Vears, Katoomba.—Generally none but ships carrying standard Marconi apparatus are fitted with Marconi Magnetic Detectors. In Australasian waters this has been supplemented by the more sensitive Magnifying Valve devices. Marconi M.D.s are still used for such classes of work as demand an absolutely reliable and stable detector, and it is still claimed that this type meets all this demands besides being the only constant detector of damped waves yet produced.

D. L. Neill, North Adelaide.—Your inquiry has been passed to the Austral Monoplane Company, 70 Hunter Street, Sydney.

J. Archibald, Innisfail, N.Q.—Navigating officer or wireless officer? There are training schools for both.

F. C. Pickering, Dandenong.—*B.E.2c* and *B.E.2a*, refer to two types of Blériot *Experimental*; another type of the same aeroplane is the *B.E.12*. They are built in London by Blériot, Ltd., and equipped with fixed R.A.F. (Royal Aircraft Factory) engines. The *B.E.* should not be confused with the *R.E.* (*Reconnaissance Experimental*) or with the *F.E.* (*Farman Experimental*), both of which are also of British manufacture.

Spad is a commercial abbreviation of the name of the manufacturers: *La Société Pour l'Aviation et ses Dérivés*. This machine was extremely popular both with British and French military pilots. It is fitted either with 150 or 200 h.p. engines, according to type.

The *A.E.G.* is a German two-seater, equipped with a 175 h.p. *Mercédès* engine. Manufactured by *Allgemeine Elektrizitäts Gesellschaft*; hence abbreviated title.

The *Arro* is a twin-engine two-seater biplane, manufactured by A. V. Roe & Co., Ltd., of London, Manchester and Southampton.



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- If you are a Teacher.
- If you are a Student.
- If you want General Knowledge.
- If you want to Travel.
- If you want to be Up-to-date.
- If you intend to be an Operator.
- If you wish to Experiment.
- If you are going to have a Station.
- If you wish to join a Wireless Club.

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WHARFIES

Especially Written for "Sea, Land and Air" by E. J. HILL

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The derricks are swinging, the winches are
clackin',

As up from the 'old come the cumber-
some crates,

The boxes an' bales, or goods done up in
sackin',

To be slung overside down to me an' my
mates.

Its "Hi! There. Stand clear!" when the
slings begin strainin'

As guide ropes are haulin' 'em into their
place;

An' we duck out from under, the ganger
refrainin'

From tellin' the slow ones 'is thoughts
to their face.

It's man's work is wharfin'; we've no time
for the weakly,

A man must be fit to keep pace with our
crowd.

We're a tough proposition, an' don't bear
ourselves meekly

Whether 'andlin' a motion or a corpse in
'is shroud.

An' the stuff that we works on—you'd
hardly believe it—

It comes from the uttermost parts of the
earth.

Is it timber from Norway? We're there
to receive it,

Same as tea from Ceylon or Scotch
suintin's from Perth.

Is it gold, is it silver, or copper or spelter?

We loads or unloads it just as we are
told.

In workin' a mailboat the pace is a welter,

An' Gawd 'elp the blokes goin' slow in
the 'old!

We 'andles the daintiest kinds of confec-
tions.

(In cases, of course), not loose like the
coves

'Oo stand be'ind counters—the pink of
perfections—

An' talk over ladies like soft 'ummin'
doves.

We 'andles the 'orses, the cattle, the
porkers—

Pure blood stock they calls 'em (we adds
a small "y")—

Some 'ave 'eels or 'ave 'orns; they are
most of 'em corkers,

An' devils to butt you or let their 'oofs
fly.

Potatoes from Tassie with apples an'
quinces,

We lands 'em an' 'ands 'em to carters
galore.

And pines from the Islands you could set
before princes,

We stacks on the wharf before sendin' to
store.

'Ides, copra or sulphur, or sheepskins or
rabbits—

They all 'um a treat, an' don't you for-
get

It's our job to receive 'em (for such is our
'abits),

An' load or unload 'em in sunshine or
wet.

One shift may "extend through a much
prolonged sittin' "

(As they say in the 'Ouse if an all-
nighter's nigh).

If we did a sit we'd soon find ourselves
quittin'

An' minus our disc in the sweet bye and
bye.

But wharfin's a game that demands brawn
and muscle,

The softies drop out, though I will not
deny

They makes a brave show with pretences of
bustle.

Is that the Smoke-O? My oath, but I'm
dry!

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ment and all important Coal Mines.**

LATE JULES VEDRINES AND HIS PROPOSED FLIGHT TO AUSTRALIA.

The untimely death last month of France's most brilliant airman, Jules Védrines, puts an end to a particularly ambitious flying project which it had been our intention to announce in a subsequent issue.

Almost simultaneously with the cabled advice of his fatal crash, *Sea, Land and Air* received from Paris a letter written by one of Védrine's commercial supporters, Monsieur J. L. Lhermit, who is also proprietor of our aeronautical contemporary, *La Poste Aérienne*. This letter announced that Védrines would shortly undertake an aerial "Tour of the Five Parts of the World," and solicited certain information regarding the city of Sydney.

From the practical nature of some of the questions which this journal has been invited to deal with it is apparent that the promoters had intended to conduct the flight along essentially commercial lines.

The itinerary of the tour had been mapped out by Monsieur Lhermit who, so far as can be ascertained from his letter, was, at the time of Védrine's death, handling the business end of the proposition.

The preliminary questions, reproduced herewith, are presented on a printed form, blanks being left for the replies.

The Aerial Tour of the World.

City of

Please state addresses at which the following are obtainable in your city:—Light petrol, castor oil (white), coal.

Which are the best and worst seasons?

What are the maximum and minimum temperatures for the year?

What are your facilities for transport by water and railway?

Has your city the telegraph and telephone?

Which are the best landing grounds?

Could a hangar be provided?

What accommodation could be provided for a seaplane?

What are the areas and depths of the bays and ports surrounding your city?

That the financial aspect has been kept in view is clearly evident in other questions, e.g., "Would your city grant a subsidy? Kindly indicate the approximate sum."

Védrines obtained his pilot's "ticket" on December 7, 1910, at Paris, where he was then employed by the manufacturers of the Gnôme aero engine. He was the first airman to fly over Paris—this exploit being performed on February 15 1911, in a Goupy biplane—and, a few months later, won the Paris-Madrid aerial contest and the Gordon Bennett Cup.

On the outbreak of war he joined the French Flying Service, and shortly after demobilisation accomplished the extraordinary aerial feat of landing on the roof of the Galeries Lafayette, a large drapery establishment situated in the heart of the city of Paris.

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WIRELESS INSTITUTES

Wireless Institutes are now being formed in all the Australian States, and when they are completed it is expected that they will be linked into one Commonwealth organisation, in order to work for the common benefit of all experimenters and private users of wireless apparatus.

NEW SOUTH WALES.—Owing to the epidemic of influenza the general meeting called for April 4th has been postponed. The meeting will be held as early as circumstances permit. Intending members are invited to communicate with the Acting Secretary, Mr. Malcolm Perry, Box 2, King Street Post Office, Sydney.

SOUTH AUSTRALIA.—All interested in the formation of an institute in South Australia are invited to communicate as early as possible with Mr. C. E. Ames, 59 Carlton Parade, Torrensville, S.A.

TASMANIA.—All persons interested in the formation of an institute in Tasmania are invited to communicate with Mr. V. McDonald Brame, 71 Hill Street, West Hobart.

VICTORIA.—An inaugural meeting of the Wireless Institute of Victoria was held in Melbourne on April 1, at the Marconi School of Wireless, 422 Little Collins Street.

The meeting had been convened by Mr. W. King-Witt at the request of the honorary secretary of the Wireless Institute of New South Wales (Mr. Malcolm Perry) also at the request of many radio-workers returned from active service, and of others desirous of recommencing experimental work.

The Chairman, Mr. E. T. Fisk, managing director of Amalgamated Wireless (Australasia) Ltd., read extracts from his * address at a similar meeting recently held in Sydney; he also read correspondence which had passed between the Wireless Institute of New South Wales and the Acting Minister for Navy.

A provisional committee, consisting of Messrs. Conry, Nightingall, Tatham and King-Witt, was appointed for the purpose of framing, for the new Institute, a set of rules and regulations, to be later con-

sidered at a public meeting of wireless amateurs.

QUEENSLAND.—The first meeting of the Queensland Wireless Institute, convened by the honorary secretary and treasurer, Mr. S. V. Colville, was held on February 26, at the rooms of the Brisbane Chamber of Manufacturers. The objects of the Institute, for submission to the inaugural meeting, were read by the chairman, Mr. H. Cornwell, these being as follows:—

(1) The name of the Institute shall be "The Queensland Wireless Institute."

(2) The objects for establishing the Institute are:

- (a) To bring into contact all persons interested in the study of electricity, especially as applied to wireless research, telegraphy and telephony;
- (b) To arrange a meeting place to facilitate study, reading, discussing questions arising from experiments, and the exchange of ideas generally;
- (c) To distribute written matter on the proceedings of all demonstrative, instructional and theoretical lectures given for the practical benefit of country members;
- (d) To form a library of books, works and periodicals on wireless, both experimentally and commercially, and to encourage the study thereof.
- (e) To endeavour to increase the individual knowledge of members by every possible means in the various fields of operation."

An inaugural meeting of the above Institute was held on March 19, in the rooms of the Brisbane Chamber of Commerce.

The office of patron was accepted by Professor Hawker, B.A., B.E., A.M.I.C.E., principal of the Queensland University, and of president by Mr. R. A. Wearne, B.A. The following were elected vice-presidents of the Institute:—Mr. S. H. Smith, Mechanical Branch, G.P.O., Brisbane; Mr. H. Cornwell, manager of the Edison Swan Electric Co., Ltd.; Mr. A. G. Jackson, A.I.R.E., of the Synchronome Electric Co., and Lieutenant E. A. Blackburn, R.A.N.

Messrs. E. M. Jack, W. J. Monkhouse, D. J. Garland, H. Priest and J. C. Price, were elected as members of the council.

The proposed rules of the Institute were read and adopted *en bloc*, the proceedings terminating at 9.30 p.m. with a vote of thanks to the chairman.

* For full report of Mr. Fisk's address, see *Sea, Land and Air*, February, 1919, pages 670-672.

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The "Star of Peace."

*From the haven of the present she has cleared and slipped away,
Loaded deep and running free for the port of yesterday,
And the cargo that she carried, ah! it was not wool or tea,
She took with her all the glamour and romance of life at sea.*

Where are all the white winged high-flyers that danced over the waters half a century ago? Where have they, and their officers, their passengers and crews vanished to? Where, indeed. Hands piped, anchors weighed, pilot dropped, they have gone out with the tide, never to be heard of more.

To many an old colonist, as to many an ancient "lord of the bunt and gasket," this photo will awaken memories of the days when the sailing ship was at the height of her glory—days when the house flag of the Thompson clippers was nearly always to be seen in Port Jackson and

Hobson's Bay. And splendid ships they were, with a highly capable after-guard, and a crowd of genuine sailormen in the foc's'le.

The *Star of Peace* was launched in 1855 from the yards of Walter Hood and Co. at Aberdeen, and, like all of the Thompson fleet, was a beautiful model.

After many years of active service for that firm she came under the ownership of Messrs. Burns, Philp & Co., Ltd., and like the *Windsor Castle* and many another fine old vessel, it was her fate to end her career as a hulk. She was broken up at Thursday Island in 1895.