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JOHN SMITH

Citizen John Smith, of Sydney, and some of his friends from other States, are decidedly "gin the Government." Or were.

"Our Government," they declared, "is a Century Behind the Times." "Our Departmental Systems are Rotten to the Core." "Our Politicians are Hopelessly Fossilised." "Hands Off Private Enterprise!"

We quote from the newspapers of Yesterday.

To-day the same old John Smith still clamours, in the same old way, for the Public Ear and the Public Eye. So do his esteemed comrades. The same old tactics are followed; the same old soap-box oratory, same old letters to the morning papers; same speakers, same writers, same audience. Everything, indeed, is as it was yesterday, with one trifling exception, *i.e.*, the "Cause," itself.

Observe the swing of the pendulum.

Hoarse from howling down the Government, John Smith (and some of his friends) now strike a new note. To-day, on the city ramparts, in a hundred open meeting places and in a dozen "suitable" newspapers, they may be seen, and heard, yelling for their old bugbear—Government

Control! Government control of this, that and every other form of industry.

"Why," shrieks Smith, "should Private Firms be allowed to Build Ships?"

"Why," writes one of his friends—and this is of interest to our flying men—"should Private Syndicates be permitted to Exploit the Air of Australia for Commercial Purposes?" (forgetting for the moment, that, scattered to the four winds of Heaven, this question, coming whence it does, suggests that Smith's friend also is exploiting the air of Australia for commercial purposes). "No Private Syndicate," he urges (in half a column of a morning paper), "should be allowed Any Aerial Rights Whatever; in fact, it should be Prohibited for any aeroplane or any aerial machine to fly over Australia Unless It Is Controlled By The Government." And so on.

And the answer? Simply this:—

Had we waited for the Government to build our first aeroplane we should probably be sitting on the wrong side of the Peace Table to-day—if not years ago.

Had we waited for the Government to build our Merchant Fleet neither Australia, New Zealand, India, Canada, the

United States nor South Africa (not to mention the many smaller nations) could have been honourably represented in Europe during the War; nor could the Allies have transported their expeditionary forces to Egypt, Salonika and the many other theatres of war in which their troops have won fame and victory.

It is to the sportsmen and citizens of England, France, America, Italy and Australia that we owe the pre-war development of aeronautics in their respective countries; a development gradually brought about by experiments involving loss of life and limb; a development without which these countries could not have engaged in a single aerial combat.

Discovered and developed by their citizens in days of peace, the science of aeronautics was placed at the full disposal of the Allied Governments for the duration of the world-conflict. The time is now ripe for the individual scientist and inventor to resume his suspended inventions and experiments. Let us have control of the air by all means, but let that control be left in the hands of responsible bodies of aeronautical experts such as constitute the existing committee of the Aero Club of Australia.

Australia has as much "control" as it can stand and we see no evidence of superfluous energy among members of its Government. Even if such did exist, there are wide avenues waiting to absorb every ounce of it, and it will be time enough to consider extending the scope of that control after the present Government has successfully solved such immediate problems as those of Repatriation, administration of our railways, tramways and postal services, the safeguarding of the public health and the defence of the country generally.

Burdened with our share of war-debt we are faced with two gigantic tasks; to regain our pre-war revenue and to discharge our liability. Neither is possible of fulfilment unless Private Enterprise be given every facility and encouragement to develop and expand along common-sense lines.

The plain dealing business man has no use for the machinery which is set in motion on receipt of his urgent request for information on any matter controlled by the Government, and which is followed, perhaps ten days later, by a printed card stating that his "communication of the — is receiving attention." This machinery consists largely of Parliamentary Debates, Royal Commissions, Orders in Council, Special Acts and Blue Books; the playthings of Politicians, Ministers and Civil Servants.

It is bad business, involving vexatious delays and loss of trade, and the sooner it is limited to absolute essentials the sooner will the business man be free to tackle the big tasks now facing him.

Government control of post-war shipping is a question which has already been thrashed out in Great Britain, and finally decided in favour of the shipping owners.

To those who would know the inner workings of this form of administration we commend the statements recently made in London by Lord Inchcape to the Proprietors of the Peninsular & Oriental Steam Navigation Company on the occasion of their seventy-eighth general meeting.

Lord Inchcape's remarks, despite their somewhat extreme length, go right to the very heart of the matter and should be fully considered by every thoughtful reader.

They are reproduced hereunder.

LORD INCHCAPE DESCRIBES GOVERNMENT CONTROL

By Our London Correspondent.

London, December 11, 1918.

The seventy-eighth ordinary general meeting of the proprietors of The Peninsular and Oriental Steam Navigation Company was held to-day at the Company's offices, 122 Leadenhall Street.

The chair was occupied by the Right Honourable Lord Inchcape, G.C.M.G., K.C.S.I., K.C.I.E., who in outlining the affairs of the company during the period of war, expressed himself with considerable forcefulness on the subject of Government control of the shipping industry.

The old business of the P. & O. Company for some time past has not been what it was, said Lord Inchcape.

But now that the war has come to a satisfactory conclusion, as our ships are returned to us, we shall as speedily as possible resume our position in the Eastern, the Far Eastern and the Australian trades, but with so many ships sent to the bottom it will take some time before we are able to offer to the travelling public the convenience, comfort and regularity to which they had been accustomed before the war.

The countries with which we have been connected in the past have realised the advantages which they enjoyed, for the forty or fifty years before the war broke out, in having a regular and punctual mail and passenger service on which they could rely, and I hope we shall soon be able to resume our regular sailings and get back into our stride.

For the last few months we have had only one ship running to India, all the others which are still afloat being employed as armed cruisers, despatch vessels, hospital ships, transports or carrying cargo on Government account.

A large number of P. & O. steamers have been running across the Atlantic, engaged in the conveyance of troops and stores. We make no complaint; all our ships and resources have been placed ungrudgingly at the disposal of the country.

The British Mercantile Marine, which was built up without a penny of aid from the Government, has borne no small share in saving the country from defeat, yet we heard a good deal of talk in certain quarters about the advantage to be gained by the nationalisation or some other sort of Government control of shipping after the war. The moment the war broke out the shipping community placed every vessel required by the State at its disposal at extremely moderate rates, known as "The Blue Book Rates," which were agreed with the Government, and at these rates they are for the most part running to-day. There was an idea in some quarters that as the Government had got control of the Mercantile Marine they should keep it. The high priest of this policy, a member of the Government who lately resigned because his views were rejected, is reported to have said in the House of Commons: "There is only one true future for the people of this

country, the establishment of a co-operative commonwealth." The common sense of the Prime Minister and the House of Commons did not support him and he has retired into seclusion, where he will no doubt devote himself to the development of his Utopian scheme. The ridiculous idea has happily been set on one side by a pronouncement of the Government that they do not contemplate the nationalisation of shipping. It would have been a poor return for what the shipowners have done for the country, for which they claim no credit, as they only did their duty, if they had been displaced.

People who advocated such a policy did not appreciate that a great part of the shipping of Great Britain is normally employed in trades which are international, the vessels so engaged never returning to these shores after leaving the builders' hands. The whole thing, if attempted, would have proved an egregious failure and would have been abandoned in a very short time, though in all likelihood too late to admit of the supremacy of British shipping ever being recovered.

Unless British shipping regains its old ascendancy it will not be shipping that alone will suffer, it will be the entire body of British trade. Shipping is the most vital of all "key industries" and unless it continues to outstrip its rivals in the future as it has done in the past, both in prosperity and adaptability, the whole edifice of our foreign commerce must collapse.

There was an idea in some quarters that freights might be kept lower if shipping was run by the Government. If the experience of the last two years is any guide, I would only say that since the general requisition came into force and the steamers have been run on Government account—not on account of the owners—freights have been raised to figures which are far above what they were when the earnings went to the owners.

While the war was in progress we all said: "Let us get on with the war, that is the only thing to be considered." Now that the war is over we say: "Let us get on with our business, let us get to work again and reconstruct the fabrics which have been injured or broken down in our successful struggle for liberty. Let us build up again the wealth of the community which has been wasted in the war."

This will apply not only to the ship-owning community, but to the whole industrial, commercial, shipbuilding, trading, agricultural, banking and financial classes.

This country will have an uphill task to get back to the position it occupied in 1914, but given freedom from Government control and its irritating and wasteful interference, the energy, the industry, the resource, and the initiative of the people will enable us to recover perhaps more speedily than is generally expected.

You can form an idea of what Government control means by looking at an order published in the papers of November 29 by a department on the subject of petrol. (*Laughter.*) I won't quote it all, but will read an extract:—

(1) This order may be cited as the Motor Spirit (Consolidation) and Gas Restriction Order, 1918, Amendment Order No. 2, and shall be read and construed together with the Motor Spirit (Consolidation) and Gas Restriction Order, 1918, hereinafter referred to as the Principal Order, and the Motor Spirit (Consolidation) and Gas Restriction Order, 1918, Amendment Order, hereinafter referred to as the Amendment Order No. 1, and the three Orders may be cited together as the Motor Spirit and Gas Restriction Orders, 1918. (*Loud laughter.*)

(2) The several words, terms, and expressions to which meanings are assigned in the Principal Order have the same respective meanings in this Order. (*Renewed laughter.*)

The Times interprets the Order as meaning that the public may now use petrol for any purpose within a radius of thirty miles from home. Unless the ordinary human being got an interpretation I am afraid he would be puzzled to know its meaning. This is a simple sample of Government control. We have no use for this sort of verbiage in ordinary business transactions. The whole community is sick to death of control and permits and licenses and priority certificates of all classes.

Reflections are sometimes cast upon the commercial community of this country for their want of enterprise. I have had the figures taken out showing the amount of money which the P. & O. and the companies associated with it have put into new ships during the last five-and-twenty years and the total runs into something approaching fifty millions. While that is our position it is in a relative degree the same with almost every shipping company in the country, and I don't think the shipping industry at any rate can be accused of lack of enterprise or

of adopting a niggardly and short-sighted policy. Half the cost of building a ship goes in wages, and as the cost of the material put into a ship practically also goes in wages, some idea can be formed of the value of the employment given to our people through shipbuilding alone, while the greater part of a ship's earnings is expended on the wages of the crew, coal, and running stores, and the production of the two last-mentioned items again affords employment.

The shipping industry of this country has been built up by the shipowners adopting a prudent financial policy of distributing moderate dividends, making ample provision for depreciation, and investing this, together with any undivided profits, in new and up-to-date tonnage. With the experience they have gained no doubt this policy will be maintained, and while we shall have grave difficulties to contend with in the future, provided we are left unhampered, I have no fear but that we shall be able to recover and hold our old premier position in the world.

We ask for no help from the Government, all we ask for is freedom from unnecessary interference and from repeated changes in rules and regulations framed at the other end of the town. The Society of Lloyds, composed as it is of shipowners, merchants and underwriters, advised by the best technical skill obtainable, trusted by the whole world, always progressive, always ready to consider any suggestion for the improvement and safety of ships, passengers and cargo, its hall mark respected everywhere, its record without blemish, is perfectly capable of safeguarding the interests of the public, and the construction of ships designed by owners for their own particular trades may be safely left to the rules laid down by Lloyds.

We hear a great deal about reconstruction after the war. If we are left alone by Government departments we are perfectly capable of reconstructing ourselves.

The coming decade is to be one of immense production to repair the damage of the last four years, improving the permanent plant of trade and communications, and resuming the normal operations which have been suspended by the war. It is to be a decade in which we are more likely to see three jobs for one man than three men for one job. There are croakers who quail before the problem that confronts us after

the victory we have gained. They see nothing ahead but internal strife and impoverishment, and they point to the difficulties of the decade that followed the close of the Napoleonic wars. I am sanguine enough to believe that we shall enter the first crucial period of peace in as favourable a position as most of our rivals.

We have a vast Empire to a great extent undeveloped, the soil unworked, and the treasures untapped.

There are without doubt disturbing elements in this country at the moment. We have some men in our midst who, I am afraid, are saturated, whether they know it or not, with the Bolshevik creed; who regard capitalists as robbers, who would be prepared to see society overthrown, who consider that labour is the sole creator of wealth, and is therefore entitled to all its rewards.

The Russian Revolution furnishes the best evidence that the world has yet witnessed of the inevitable results of such doctrines. You can see in Russia, in full and deadly bloom, every economic fallacy and every form of political quackery that has ever bewitched mankind. Russia today is a reference library of all the social, governmental, financial and industrial errors that it is possible for half-educated or wholly uneducated men, spurred on by passionate greed and hatred, to commit. If you want to know what happens when the workers are incited not only to believe but to act on the belief that the industries in which they are engaged are their own creation, belong to them, and should be operated by them, and that the man who thinks and organises should be denounced and treated as an enemy, you have only to look at Russia.

When capital—which is seed corn reserved to beget a harvest—is counted as something only to be confiscated, you have only to look at what has happened in Russia.

When groups or sections of industrial units act as though they were the whole nation, in disregard of anything and everything else, you have only to look at what has happened in Russia.

In that country, for the time being, all thought and energy are occupied, not in the production of goods or wealth, but in the problem of distribution or destruction of what already exists. Its people are obsessed with the theory that everybody will be richer if everybody steals from the other,

and they are blind to the fact that universal ruin, famine and anarchy will be the fruit of such policy.

It is inconceivably sad that Russia, with a population and resources greater than any other country in Europe, should have fallen to her present state; and her condition is an object-lesson which ought to go home to us all.

So far as shipping is concerned, if it had been decreed that Government officials were to be allowed to control us, while allies, neutrals and enemies were free, there obviously would have been only one course open to the P. & O. Company. We would have built no more ships, we would have disposed of the two millions of tonnage which we and our associated companies possess in the best available market, we would have divided our assets amongst our shareholders, and retired from business. I don't think we would have had any difficulty in selling our ships, the shipping communities of the allies, neutrals and others would have been only too glad to buy them.

There has been a great deal of talk about the standard ships which the Government has built. I don't know who was originally responsible for the idea, one seldom knows who is responsible where the Government is concerned. We have never yet heard, for instance, who was responsible for the fiasco of the aerodrome at Loch Doon, that deplorable spectacle which I had the curiosity to look at a few months ago. I saw miles of broad macadamised and asphalted roads which had been made leading now to nowhere, I saw wide stretches of moorland laid with concrete which it will not pay to pick up, I saw wet docks which had been constructed in the loch, and acres of a marsh, the drainage of which had been attempted with miles of piping, but which still is and always will remain a bottomless bog. There were hangars built for aircraft being dismantled, there were huts for the accommodation of 3,000 workmen being levelled to the ground, there was an aerial railway on huge concrete pillars which it won't pay to demolish, a line of railway had been constructed which was being used to bring back motor boats, steam launches and other salvage. The visit had the effect of a nightmare. Even when everything is removed which can be removed, there will still remain, unobliterated for generations to come, far away among the Ayrshire mountains, a monument to the folly of

their ancestors such as posterity will scarcely credit. I think a bronze plate might well be fixed on one of the gigantic concrete pillars with the words "THIS DERELICT WAS NOT THE OUTCOME OF PRIVATE ENTERPRISE." (*Laughter*).

Had shipowners been allowed to build their own ships the British Mercantile Marine after the war would have been much better equipped for the general trade of the world than it is to-day, and so far as meeting the requirements of the war goes, there would, I believe, have been just as many ships afloat or nearly so as there is now. I have nothing to say against the so-called standard ships, they are excellent vessels in their way, but we have always built standard ships. We settle the type of ship we require, and we place an order not for one ship but for several, and the builders proceed right away. Standardisation, however, has its limits. We decline to be fossilised, and the next batch which we build is an improvement on the previous one. There is no finality in ship design or construction. I venture to say it would have been infinitely better if owners had been left free to invest their depreciation, surplus earnings, and the amounts they have obtained for the ships that have been sunk in replenishing their fleets.

While settlements have been arrived at for ships sunk by the enemy, we have suffered severely in the case of ships destroyed in the early part of the war before values increased to the present-day figures. For instance, for one ship, which cost close on a quarter-of-a-million, we recovered £86,675; for another which cost considerably over a quarter-of-a-million, we recovered £40,171. For a third we recovered little more than half her original cost. Had we been permitted to make contracts to replace these vessels when they were sunk, the position would not have been so bad, but practically no shipowners have been allowed to build on their own account for the last four years, and the consequence will be that when we are again permitted to build we shall have to pay two or three times the pre-war prices, and the amount recovered for the three ships which I have mentioned will not be sufficient to replace even one-half of one of them. The position is very serious and is causing the Board no inconsiderable anxiety. The total amount recovered by the P. & O. Company for vessels destroyed will be far short of the cost of replacement unless prices fall very materially. As things stand at present, when

earning power is considered, we are certainly two to three millions to the bad if the value of the ships lost is compared with the amount we have recovered. Meantime we must go on replenishing our fleet even at the present high prices.

One thing the war has done for British shipowners, and that has been to bring them more together. When it became necessary to divert ships from their previously recognised trades to other trades it was laid down and confirmed by the Shipping Controller that there was to be no after-war poaching, and that each line, when things became normal, was to respect the others' pre-war trades. In this way ships were handed over from one owner to another for work in full confidence. When the liner requisition comes to an end, as we hope it shortly will, we shall, I trust, all honourably revert to our various spheres, and I hope there will be no disposition by one to take advantage of the other by means of information gained or relations established while we have been fighting the common enemy.

I am afraid, however, attacks will be made by those who are not British. Severely dips have already been made into many hitherto British trades by allies, associates and neutrals, and British shipowners will have to fight to regain their positions. This they will be prepared to do, though they will be working at a great disadvantage from the fact that their profits have been severely limited, while the profits of others have been fabulous. The Government, for instance, are paying the British shipowner something like twelve to fifteen shillings per ton per month, and at the same time they are paying for neutral tonnage as much as forty to fifty shillings.

During the past two or three years we have naturally had a good deal of business to transact with the Controller of Shipping.

I am very much afraid the time is not far distant when many shipowners and shipping companies will find their profits considerably short of the pre-war standard, and it would be no more than an act of justice were this discrimination against the shipping community repealed and shipping put on an equality with all other business concerns in the country. If Great Britain is to recover commercially it must get rid of the excess profit duty. There is no greater deadweight on enterprise, initiative and industry than this tax. We all bowed to it when it was introduced, we loyally

accepted the increases, but those of us who are engaged in business realise that its operation is vicious in the extreme. Human nature being what it is the impost leads to indifference and to extravagance, not only on the part of principals but on the part of the staff. It is no uncommon thing for an application for an increase of salary to be supported by the plea that after all Government—that is, the taxpayer—will pay 87½%, while ventures or developments which would be seriously considered are brushed aside, for the reason that if they turn out well the Government will take the lion's share, and if they turn out badly the entire loss falls on the adventurer. The tax also completely prevents any man starting in business for himself, as all he will be allowed to keep out of his profits is a moderate rate of interest on his capital plus a mere fraction of his profits, if he makes any. This is not good enough for the risk.

I mentioned a year ago that the Government had taken over two British India steamers which were under construction, and had appropriated our favourable pre-war contracts, and that we might have to proceed against them under a petition of right as we had failed to obtain any redress. Negotiations went on for many months, and eventually out of sheer weariness we came

to a settlement. I am afraid we made an uncommonly bad bargain, but running backwards and forwards to the other end of the town taxes human endurance and our friends up there know how to wear out the public. I suppose the more they are able to reduce legitimate claims the more it counts for righteousness, but it is hard on the victims.

Some two-and-a-half years ago, in conjunction with some shipping friends, we purchased land at Chepstow and began to lay out a modest building yard, with every prospect of making it a success, but fifteen months later Government stepped in, commandeered our property and plant, and turned us out, with the idea of converting it into a great national shipyard. Protracted negotiations took place over a settlement, and this was not reached till August last, when we were paid out on terms which, while they involved us in no pecuniary loss, were extremely favourable to the Government. It was a severe disappointment to us all to be deprived of this building yard which we believed had potentialities if carried out on commercial lines, but the matter is now one of past history and as Marryat says in "Jacob Faithful," "What's done can't be helped." We are living in disjointed times.

COMMONWEALTH AIR FORCE UNITY OF CONTROL FOR MILITARY AND NAVAL SERVICES

FROM OUR MELBOURNE CORRESPONDENT

As a result of conferences between Mr. G. Swinburne, Chairman of the Board of Business Administration at the Defence Department, and officers of the Naval Administration and Defence Department, an arrangement was arrived at which has been under the consideration of the Commonwealth Council of Defence.

The outcome of this was a set of recommendations to the Federal Government, the nature of which may be gathered from the Government's decision, which is, briefly, that both air services will be placed under one central control. This decision is generally welcomed, though there were members of the Naval and Military Departments who would have preferred to see the two "wing" services separate, as has been the case up to the present. The junction of the two units, which was found necessary in the United Kingdom for the successful prosecution of the war, is believed to have exercised a considerable influence in the

decision arrived at by the various bodies who have had the matter under consideration. The finding of the Federal Government, it is held, will result in considerable progress being made in this arm of our national defence, and the decision is regarded as particularly timely, in view of the arrival from England of a number of aeroplanes, which have come out to the Defence Department. These machines, though their exact details are not yet available, are said to embody improvements, the results of the latest experiences in the war. A new and large aerodrome is to be erected, and it will be remembered that for this purpose a sum of £50,000 has already been ear-marked. Aerodromes in different parts of the Commonwealth will be erected, but it is not possible to state exactly when; still it is safe to say it will be just as soon as financial exigencies allow. In the Treasurer's next financial statement to the Federal Parliament the question will be fully dealt with.



Aerial Services (Sydney-London), Limited: Departure of Survey Expedition.

- (1) and (2) At the starting point. Members of the expedition on the lawn of Mr. G. A. Lloyd's residence at Five Dock (N.S.W.).
- (3) and (4) A final overhaul of the motor-bicycles.
- (5) The actual start. Passing the gatepost of Mr. Lloyd's house. First past the post, Mr. Marduel. Time, 8.43 a.m. January 31, 1919.
- (6) Mr. J. C. Marduel (late of Australian Flying Corps) ready to start. He accompanies the expedition as aeronautical expert.

HOW WIRELESS MESSAGES ARE SENT

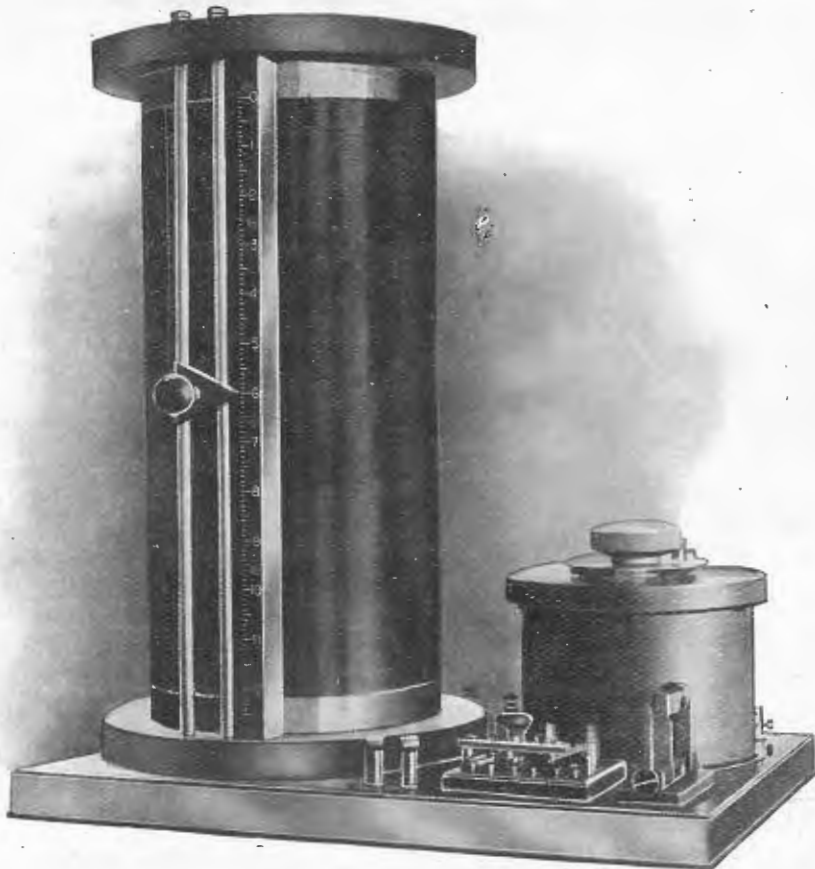
Especially Written for "Sea, Land and Air"

By ERNEST T. FISK, M. Inst. Radio Engineers.

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III.

[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.]



Apparatus Used for Tuning a Wireless Receiver.

Our last article explained how a wireless wave travels over the surface of the earth and sea, and described the simple mystery of wave lengths.

The next item in our programme is another mystery, which is commonly known as

"Tuning."

Everyone knows something about piano-tuning, and, although wireless tuning is similar in many respects, that is not exactly the thing we are coming to just now.

Nowadays, all wireless stations are

carefully "tuned." An untuned station would infringe the international laws governing wireless communication. It would be something akin to a Hun submarine, seeking its own unlawful ends without consideration for the rights of others.

There are two important reasons why a wireless station must be tuned.

These are, first, to avoid unnecessary interference with other stations, and, second, to enable large quantities of energy to be radiated from the sending station.

The first great step in wireless communication was made when Marconi invented the elevated aerial for sending and receiving messages; that was in 1896. The second step, and one of the most important ever taken, was the invention by Marconi in 1900 of the means of successfully tuning both the sending and receiving stations. Marconi's 1900 invention, which has since become famous by reason of successful actions for infringement in Europe, America, and Australia, supplied a simple and successful method of sending and receiving messages without unnecessary interference, while it enabled greater quantities and energy to be radiated.

It is interesting to relate how Marconi's practical genius solved a problem which all scientific men understood, but which none but he successfully overcame.

As early as the year 1892 the famous scientist, Sir William Crookes, wrote in the "Fortnightly Review":—

"Whether vibrations of the ether, longer than those which affect us as light, may not be constantly at work around us, we have, until lately, never seriously inquired. But the researches of Lodge in England, and of Hertz in Germany, give us an almost infinite range of ethereal vibrations or electrical rays, from wave-lengths of thousands of miles, down to a few feet. Here is unfolded to us a new and astonishing world—one which it is hard to conceive should contain no possibilities of transmitting and receiving intelligence. Rays of light will not pierce through a wall, nor, as we only know too well, through a London fog. But the electrical vibrations of a yard or more in wave-length, of which I have spoken, will

easily pierce such mediums which, to them, will be transparent. Here, then, is revealed the bewildering possibility of telegraphy without wires, posts, cables, or any of our present costly appliances. Granted a few reasonable postulates, the whole thing comes well within the realms of possible fulfilment. What, therefore, remains to be discovered is, firstly, *simpler and more certain means of generating electrical rays of any desired wave-length.* Secondly, *more delicate receivers, which will respond to wave-lengths between certain defined limits, and be silent to all others.* Thirdly, *means of directing the sheaf of rays in any desired direction."*

Two years later, in 1894, Sir Oliver Lodge, in a lecture, explained that tuning was then the great unsolved problem of wireless communication. He predicted that without successful tuning any material extension of wireless communication would be practically impossible. He showed also that successful tuning was at the time impracticable, because it would be necessary to make an electrical circuit perform two opposing functions at the same time.

Although Lodge attempted a solution in 1898, his method was nothing more than a compromise between those two incompatible conditions. Marconi's invention of 1900 solved the problem with such success that the range of communication was immediately increased from a few miles to 3000, and from that day the world-wide application of this wonderful science began. This work, together with his later developments, secured the acknowledgment of the scientific world, and resulted in the award to Marconi of the Nobel prize for physics, and later the Franklin medal, as well as a large number of other honours and decorations.

The Problem.

The problem had been outlined by several men of science, some of whom were pessimistic in their views about the future.

In order to send an impulse from the aerials of a wireless station, it is necessary to create a violent disturbance in the ether, and to create such a disturbance we must put a comparatively great

amount of power into the aerial, and that power must be readily given up to the ether, *i.e.*, radiated.

That is to say, that our aerials must be supplied with great energy, which they must promptly impart to the surrounding ether.

The early Marconi aerials of 1896 did a part of that quite successfully. Whatever energy they received from the source was readily given off to the ether, but there was a limit, and rather a low one, to the charge which could be put into them.

Now the thing most needed was to be able to send from one station to another without interfering with the working of a third, a fourth, or any other stations that might be within range. For instance, a station at Sydney should be able to send a message to Hobart without preventing Melbourne receiving a message from Brisbane at the same time.

The only way to do this was to have the wireless stations tuned in a manner analogous to the tuning of the different strings in a piano.

To understand this tuning clearly we will imagine a piano placed in a quiet room. If we drop a heavy book or a weight on to the floor, or better still, if we fire a pistol or crack a stockwhip in the room, we shall hear every string in the piano singing to its own particular note. (No one string can give a note different from that to which it has been tuned.) The sudden and loud report in the room has sent an energetic impulse or wave through the air. This impulse has given a push to every string, and set it swinging at its own rate of vibration, and consequently giving out its own particular musical note.

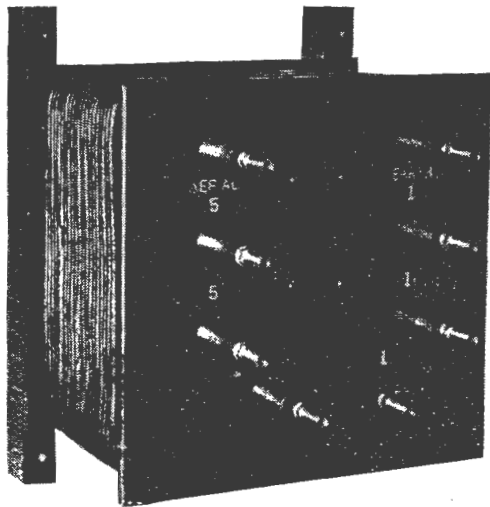
A similar occurrence takes place when a wireless impulse is sent out from an untuned aerial. A sudden rush of energy goes through the ether, and every receiving aerial within range, just like the piano strings, is set vibrating at its own particular rate.

Such a state of affairs could not be permitted, or the ether would be nothing but a jumble of wireless impulses affecting every receiving station within range, and thus causing endless confusion.

To understand the solution we must return to the piano in our quiet room. If now, instead of making a sudden "noise," we create a pure musical note, and provided the note is sufficiently loud to affect the piano, we shall hear one string in the piano sounding in response. All other strings will be silent; the only string sounding will be the one that is "tuned" to the same rate of vibration as our musical note.

That is due to the principle of sympathetic resonance and that same principle is applied in our wireless stations at the present day.

Instead of sending out an ether wave like a pistol shot or whip crack, which would disturb every receiver within



Portion of Apparatus Used for Tuning a Wireless Transmitter.

range, we send out "tuned" waves, which will only affect a receiver or receivers which are "tuned" to the same rate of vibration or the same wave-length.

It was well known, before the year 1900, what was needed. Crookes and Lodge both described that, but the problem was how to produce that nicely tuned impulse at the sending station, and that closely tuned detector at the receiving station.

The difference between the noise of a pistol shot and a pure musical tone is in the rate at which the sound energy is given off, or radiated from its source. In

the case of the pistol shot or the whip crack there is practically one bang. The whole of the energy is given off in one "gust," and so a sudden impulse goes out and gives a vigorous push to everything within range. When it strikes the piano strings, each string gets a push, and is then left to vibrate at its own frequency until all the energy it absorbed from the passing wave has been dissipated.

But the pure musical tone which we produce in the second instance consists of a long series of smaller vibrations, each one following its predecessor at a definite interval of time, and with a definite amount of energy in each swing. Now, when that comes along and strikes the piano strings, they all try again to vibrate with their own frequency, but only one string can do so. The others immediately fall out of step with the train of arriving vibrations, because the strings are moving at a different rate, and when they try to go in one direction the vibration is out of step, and trying to force them in the other direction. The one string which vibrates at the same rate falls into step with the arriving train of energy, and gains energy from each impulse, with the result that it is kept swinging as long as the vibrations continue to arrive, and it accumulates a considerable amount of energy, more in fact than it would collect from the pistol shot which started with such a great push.

At our wireless sending station the untuned aerial takes all the energy it can hold, and throws it off in one strong gust, but the tuned aerial only gives off a small quantity at regular intervals.

It will now be seen quite clearly that if we are to work a number of wireless stations within a restricted area, our sending stations, at least, must be tuned. Yet, on the other hand, if we are to communicate across any appreciable distance, our aerial must radiate energy very vigorously.

Here was the great difficulty which seemed insurmountable. Our aerial must be a good radiator, *i.e.*, it must give off energy quickly and vigorously, yet it must be a good vibrator (oscillator), which means that it must keep most of

its energy, and only give off a little at each swing.

This would seem to be quite impossible, because the two conditions require exactly opposite properties. Lodge attempted a compromise by reducing the efficiency of his aerial as a radiator, to increase its efficiency as an oscillator, with the result that his apparatus was inefficient in both directions.

Marconi's solution was at once practical and effective. He produced two electrical circuits—one was designed to store large quantities of electrical energy, and to radiate it slowly, and which was, therefore, a good oscillator, and that was connected (coupled up) with a circuit which was a good radiator. The result was that the aerial or radiating circuit could draw energy from the oscillating circuit, radiate it promptly, and continue to draw upon the persistently oscillating reservoir.

This function was cleverly explained a few years ago by an eminent K.C., who described the action between the two circuits as the miserly father supporting the spendthrift son.

By this means a well tuned wave could be efficiently radiated, and by adjusting the "capacity" and "inductance" (see first article) of the circuit, the wave could be made any required length.

Another very important point in that invention was the necessity for tuning the two circuits, which now make up the sending apparatus, together.

If they were not adjusted to the same rate of vibration, they would be continually out of step and interfering with one another, and most of the energy would be lost.

If the two circuits are "tuned" together they will work in "step" or "harmony," and with the greatest possible efficiency.

In the simple form of aerial, before the two tuned circuits were invented, there was always a limit to the amount of energy which could be supplied and radiated. Since nearly all the energy was given off in that first blow, it was necessary to make the blow as heavy as possible; or, in other words, we had to put as much electrical energy into the aerial, before the blow, as it would hold.

Here was a limit, apart from any of the foregoing disadvantages, to the effectiveness of our station. The more we improved the radiating properties of the aerial the less energy it would hold, and the more we increased its capacity for energy the less efficient it became as a radiator. That was a vicious circle restricting our advance in either direction.

Marconi's great and simple invention, therefore, solved all the great problems of the day in one act. It not only enabled us to "tune" our wave impulses, but it allowed us to use an aerial which was a good radiator, because its small storage capacity was continually replenished from the much larger capacity of the good oscillating circuit to which it was coupled.

At the receiving end the same principles were applied. Instead of connecting the detecting apparatus directly in the aerial circuit, which, if it was to be

a good absorber of the passing waves, must be a poor oscillator, and, therefore, incapable of being closely tuned, the detector was connected into a good oscillating circuit, which was coupled with the aerial.

The energy readily picked up by the aerial was promptly handed over to the oscillating circuit, which could be adjusted to respond only to the desired wave length.

The two circuits of the receiver were tuned to the same frequency as the two circuits at the sending station; therefore, we had four circuits all tuned together.

In the next article we will explain more about the method of coupling the circuits together, and then describe some of the apparatus at present in use, including that employed at the famous Carnarvon station in Wales, which sent the first direct wireless messages from London to Sydney.

CHARACTERISTICS OF AERIAL PILOTS

The Premier (Mr. Holman) has received through the Publicity Bureau of the Agent-General's Office a bulletin of the Imperial Press Bureau dealing with the "Characteristics of Successful Pilots." The memorandum, a copy of which has been forwarded to this journal, explains in condensed form the principles followed in the selection of men for the Royal Air Force, and is of more than passing interest, in view of the probable early commercial development of aviation.

The bulletin is as follows:—

Four years of war have probably brought more scientific development of aviation than could have been obtained in fifteen years of peace.

This development has, of course, been most marked and apparent on the technical side, but progress no less important has been made in other aspects of this great subject.

One of these aspects, which will be of great importance in the future commercial development of aviation, is the study of the mentality and psychology of the flying man.

Flying in the sense of actual piloting demands rather more than mere physical fitness. It requires a certain temperament, certain distinctive psychological characteristics to make a really good pilot.

The discovery and classification of these characteristics has for a long time been the subject of exhaustive study and investigation by the medical service of the Royal Air Force.

This work is, of course, additional to the specialised physical examination, which all applicants for the R.A.F. undergo, and which, in itself is a very carefully devised test.

It was found that in some cases men of perfect physique—apparently quite unafflicted with nerves—absolutely failed to make even passable pilots. This discovery led to the formation of a special "medical flight," where such pilots have been able to work under specialist medical supervision, the causes of their failure ascertained, and, wherever possible, remedied by special treatment.

During the rough and tumble of 1914, the

selection of successful pilots was necessarily a good deal a question of the survival of the fittest. After this stage a careful medical and physical investigation was made of the survivors of that gallant band of R.F.C. pilots who went out with the first five squadrons in 1914. From the results of the investigation the preliminary data as to the necessary *physical* qualifications of a successful pilot were obtained, and now form the basis of the standard required by the present R.A.F. Medical Board at Hampstead, by which all aviation candidates have to be passed.

Later on, and as soon as the exigencies of war permitted, an investigation on similar lines was made as to the characteristic *mentality* of these same pilots, and with the information thus collected, the medical flight began its important work.

The doctors' room close to the aerodrome at Hendon, the present home of this interesting flight, is full of instruments more impressive than informing—to the layman. Dials, tubes, wheels and screws remind one more of the pilots' cockpit than a medical consulting room; and perhaps that is why the flying officer seems at once to feel at home there.

One of the first mental qualifications required by a good pilot is keen alertness. Action must follow thought with lightning rapidity. To determine capacity for this certain tests, known as reaction tests, are applied. One of the simplest of these is the light test. An electric lamp is suddenly switched on, and the flying officer

is told immediately he perceives it to press a key. By this means is measured, to the thousandth part of a second, the time which elapses between the lighting of the lamp and the *action* of the pilot which follows his perception of it.

But mentality is not the only factor. The emotional element is also important, and is the basis of another series of tests depending upon blood pressure for their accurate recording.

For instance, fear has certain known effects upon blood pressure; as also, of course, have anger and other emotions. It is not desired that a pilot should be without fear. Fear is one of Nature's safeguards. But what is important is the effect of fear upon the individual. It has two very different effects upon different organisms: paralysis and stimulation. Obviously, the flying man must be capable of fear stimulation, and by means of strange looking instruments—combined all along, of course, with a close, expert study of the psychology of the pilot under his care—the doctor gauges his temperamental suitability for flying.

For many months this important work has been going on, and quite apart from its immediate military use, the statistics and experience so gained will be of extraordinary value in settling the physical, mental and emotional standard of those pilots to whom the safety of aerial passengers will so soon be entrusted. The data thus obtained will be simply invaluable in the coming era of aerial development and exploitation.

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THE STORY OF THE "MATUNGA"

Especially Written for "Sea, Land and Air"

By EDWARD J. HART

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With the sole exception of the *Waratah*, which disappeared in 1909 while on a voyage from Durban to London, and whose ultimate fate remains a mystery even to this day, no vessel from Australia has provided so much food for speculation as the Burns, Philp liner *Matunga*, of which no word was heard for several months after her departure from Brisbane on July 27, 1917, and which (as is now generally known) steamed innocently within range of the six-inch guns of the German auxiliary cruiser *Wolf*, which lay in wait for her off Rabaul.

The capture of the *Matunga* on August 7, 1917, the landing of her passengers and crew at Kiel some seven months later, the liberation of the victims on the signing of the armistice in November last, all are features which to-day have become almost historical; but there remain certain aspects of the incident which have not yet been made public.

With the recent return to Australia of the first few members of the *Matunga's* crew it is now possible to almost entirely reconstruct the story of her capture and loss, at the same time substituting authenticated facts for what, hitherto, had been largely theory and conjecture.

Examining these in the order of their occurrence, one is impressed by two salient features; first, the importance of wireless telegraphy in its value to the man at sea, whether he be friend or foe; second, the smug assurance of the German nation, as exemplified by the commander of the *Wolf*.

Kommandanten Fregattenkapitän Neger, to give him his full title, wrote a book, on his return to Germany, recounting the adventures of his vessel. Some of his printed statements, if admitted as evidence, will materially support the claim of the *Matunga's* owners against the German government; for Neger, not content with an admission of pilfering the Australian merchantman's cargo, goes fur-

ther; he specifies the articles stolen and describes the various uses to which they were put.

The title of the book is:

*S.M.S. WOLF.

By FREGATTEN-KAPITÄN NERGER.

It is illustrated with seventy-three photographs incidental to her voyage, and published at one *mark*.

The cover design, which we reproduce herewith, depicts the figure of a wolf, wild-eyed and relentless, poised on the crest of a mountainous wave. It bears the imprint of a Berlin publisher, August Scherl, and if further proof were required

* Seiner Majestät Schiff—His Majesty's Ship.



The German Version.

Cover Design of Book Published in Berlin by the Raider's Captain.

of the popularity of this form of literature, one has but to note that the present edition ran into 100,000 copies. Similar books, describing the first and second cruises of the notorious *Möwe*, have recently come into our possession. These are compiled and illustrated by her commander, Count Dohna, and will be dealt with, as space permits, in subsequent issues of this journal.

In the following pages we shall consider the loss of the *Matunga* and the circumstances immediately preceding and succeeding it, first, as narrated by the commander of the German raider; next we will present the experiences of Australian prisoners, both aboard the *Wolf*, and, later, in various prison camps in Germany, as recounted to the present writer by the men themselves.

Finally, one must consider the loss of vessel and cargo from a financial standpoint, giving in turn the attitude of the owners towards officers and crew and their dependents, and the attitude of the Commonwealth Government towards the owners of the unfortunate vessel.

In publishing these undoubted facts indebtedness must be acknowledged to Mr. Robert Sharland Taylor (of Wanganui, New Zealand), wireless officer in the *Matunga* at the time of her capture, and to Mr. Roy H. Alexander (of Sydney), who held a similar appointment in the Union Steamship Company (New Zealand)'s steamer *Wairuna*, which also fell a victim to the *Wolf*.

Both have returned to Australia during the past few days, Mr. Taylor having spent seven months aboard the raider prior to being imprisoned in Germany, and Mr. Alexander nine months. Mr. Taylor and Mr. Alexander have given great assistance in the preparation of these notes, and each has brought back to Australia, as souvenir of his eventful voyage in her, a copy of the book of "S.M.S. Wolf."

THE BOOK OF THE "WOLF."

"My orders," begins the author of this remarkable publication, "were to destroy shipping, to wage a trade war and to adopt various other war measures, chiefly that of mine-laying in distant seas, especially in the Indian Ocean."

The following dimensions of his vessel are given:—

Length, 408 feet; breadth, 51 feet; depth, 25 feet 6 inches. Of 6,000 tons register, she carried seven 6-inch guns and four torpedo tubes. Her officers and crew exceeded 350 "heads."

He describes her departure from German waters on November 30, 1916, followed by three weeks of fog, storm and hurricane in the North Sea, and her arrival on December 10 in the Northern Atlantic.

An account of Christmas and New Year celebrations occupies several pages, while an entire chapter is devoted to the ceremony of "crossing the line" early in January.

The 16th of that month finds the *Wolf* sowing mines ("hell-machines," as her captain terms them) some thirty miles off the South African coast. While thus engaged he receives his first unpleasant surprise. To give the incident in his own words:—

In the late afternoon a column of smoke was sighted and soon we made out seven ships steaming in company; an English convoy, transporting Australian troops to Europe, where they were to bleed for the Motherland. Just as the *Wolf* prepared to spring upon his prey the rude shock came.

At the head of the convoy was an English armoured cruiser.

So we continued on our course as a peaceful merchant ship, drawing away very gradually in order to get out of this uncomfortable neighbourhood. I breathed more freely when the convoy disappeared in a northerly direction taking no notice of us.

Resuming his courageous narrative, he now sets out through the Indian Ocean, "keeping clear of all steamer routes."

The Kaiser's birthday is observed "in customary fashion; speeches, cheers and concerts."

Passing through what he describes as a "Mauritius hurricane," the vicinity of Ceylon is reached towards the middle of February. He lays his mines off Colombo and at various points along the Indian coast, notably Bombay.

Enthusiastic readers are now regaled with accounts of the sinking of the *Worcestershire* and *Perseus* in the newly mined areas, and, later, of the loss of the P. & O. Company's *Mongolia*, also claimed as a victim to his activities. Next, he announces with deep satisfaction, receipt of wireless information to all shipping that the Port of Bombay had been closed.

The first part of his programme being completely carried out, "we now," he writes, "steamed off to harass commerce in another manner."

He describes the capture, on February 27, between Colombo and Aden, of the *Turritella*. In pre-war days she and the *Wolf* had been sister ships, owned by the Hansa Steamship Company, of Bremen. The *Turritella* was launched as *Gutenfels*, the *Wolf* as *Wachtfels*. The former was seized in Alexandria by the British at the outbreak of war, and re-named.

The *Turritella's* crew were now transferred to the raider, and a prize crew sent aboard her "near relative," the latter being sent off by the *Wolf* on an "auxiliary mine-laying expedition." "We parted on our respective ways," says Nerger, "to meet again later at a determined point." However, this happy reunion of the sisters was not to be, for within a week of their separation the "auxiliary mine-layer" again fell into British hands, thus somewhat upsetting her engagements.

The *Wolf* steamed south, and on March 1st encountered the British steamer *Jumna*, bound for Calcutta with a cargo of salt. An attempt to fire a "warning shot" proved disastrous to the considerate gunners aboard the raider, for an explosion in the breech of one of her guns killed four and injured twenty-four of her crew. The *Jumna*, however, was duly sunk two days later by bombs, after being relieved of her coal.

Next on the casualty list comes the *Wordsworth*, from Rangoon, carrying 7,000 tons of rice for London.

"We sailed further south through the Indian Ocean and rounded the south of Australia." Follows the destruction of the *Dee*, a full-rigged, Mauritius-owned ship, bound for Western Australia. "Sunk, after being stripped of provisions."

We now rounded Australia and cruised for some days in the southernmost portion of the Tasman Sea and south of New Zealand, waiting for grain and coal ships. We were not yet in absolute need of coal, but much of our store had been used and had to be replenished. Our wait in these waters was discouraging, for the coal trade between Eastern Australia and South America, which previously followed this route, had obviously come to an end. For several weeks we stood without sighting a ship and then set our course further north, but here also there were no steamers; the cargo space of our enemies had become extremely scarce! Accordingly we voyaged to the Eastern exit from Cook Straits. Everywhere the same picture; nowhere was anything to be taken but the most insignificant commerce.

The wireless messages which we had intercepted brought us very little news, except one from an Australian station announcing that on April 7 the United States had declared war against the Fatherland.

On May 14 we picked up a message intended for a firm in Apia, that the American schooner *Winslow* would take a cargo for Sydney. We were then north of New Zealand, and although our seaplane was sent up nothing was seen.

On May 22 I put into Sunday Island to overhaul our engines. This was completed 16 days later, and I had just received the engineer's report to that effect when, to the north of the island, there appeared above the horizon the wireless aerials of a steamer.

Here follows the story of the capture and sinking of the Union Company's steamer *Wairuna*, which it is hoped to publish in detail at a later date.

Resuming the account of his operations, the pirate writes:—

Before the *Wairuna* had commenced her voyage to the bottom we sighted a four-masted sailing vessel. This was the American schooner *Winslow*, of which we had heard so much by wireless, bound from Sydney to Samoa, and carrying 325 tons of coal besides a cargo of firebricks; the latter were very useful in our furnaces. The *Winslow* followed his predecessors, being stripped and blown up.

The writer now becomes retrospective, and refers, exultantly, of course, to vessels which had struck his earlier mines, claiming among these victims the steamer *Cumberland*, and concluding the chapter in the following words:—

We know that losses still occurred in the Tasman Sea as late as November, and on our return to the Homeland we read newspaper reports of comments in the Australian Parliament on the number of large steamers which had fallen victims to German mines in Australian waters.

For the ensuing chapter of his book the pirate has selected the title "Kapitän Donaldsen." This chapter, seven pages of which set forth the German version of the *Matunga* incident, opens with a brief account of the sinking of the American whaler *Beluga*, laden with whale-oil and benzine, "the latter coming in very handy for the seaplane's tanks," and the four-masted American schooner *Encore*, carrying timber from North America to Sydney.

Then comes the *Matunga*, described in the following terms:—

We cruised past the Fiji Islands, and on July 27 reached German (*sic*) New Guinea. Here we intercepted a wireless message to Rabaul, which ran as follows:—

"BURNS PHILP, RABAUL.
"DONALDSEN LEFT SYDNEY, 27th,
VIA NEWCASTLE, BRISBANE, WITH
340 TONS CARGO, 500 TONS WEST-
PORT COAL FOR RABAUL, AND 236
TONS CARGO ROR MADANG.

"(SIGNED) BURNS."

Rabaul, the former seat of Government in

German New Guinea, was now occupied by the English Governor.

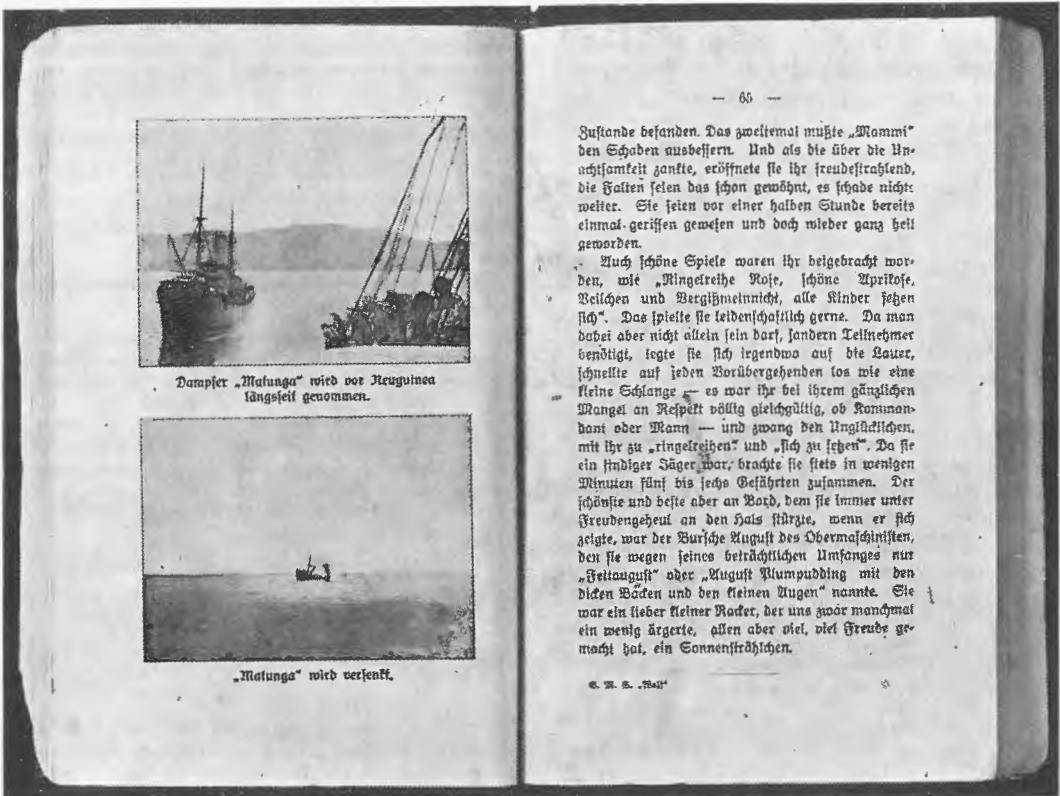
We were still speculating as to the identity of Donaldsen when a second message flashed in:—

"29th JULY, 8 P.M.—STEAMER MATUNGA, NEAR BRISBANE.
WE SHALL BE OFF CAPE MORETON
MONDAY, MIDDAY."

Here, then, was our solution to the mystery; *Matunga* and *Donaldsen* must be one and the same. We estimated that she would make so many miles per day and appear about August 5.

I had previously intended to cruise further ahead, but this was too good to miss; I decided to wait, for this amiable pre-announcement to the Wolf of his future guests, this public confidence in him, must certainly be requited; nor must the *Matunga* be given any cause for complaint as to our reception of her.

Several times daily the seaplane ascended in search of *Matunga-Donaldsen*. On August 5, alighting on deck after one of these ascents, she reported that nothing was in sight, but, just as she was being made fast our long wait was at last rewarded. Captain Donaldsen wirelessed to Burns Philp at Rabaul:—



Reduced Facsimile of Two Pages of Nerger's Book.

The text beneath the illustrations reads (1) "Steamer *Matunga* being taken alongside, off New Guinea." (2) "*Matunga* sinking."

"WILL ARRIVE MORNING 7th.
PLEASE ARRANGE FOR ME TO DIS-
CHARGE COAL TO BURROWS
DIRECT."

Burrows? Who, or what, is that?

In the Navy List we found an American destroyer of that name, and concluded that it must be she who now lay at Rabaul waiting to be coaled.

Clearly the *Matunga* was coming, and, inevitably, she would be in our hands next morning; she had but to appear!

We got under way and steamed slowly ahead.

Late that night the lights of the *Matunga* were seen immediately behind us; we lay in exactly the right position to seize her.

At dawn the *Wolf* swooped down on his prey.

The prize officer whom I sent over to her had received his instructions, and the whole affair had been well rehearsed. He had merely to go to Donaldsen and say:—

Hello, Kapitän! where are your 500 tons of Westport coal for Burrows and the 340 tons of general cargo?

Captain Donaldsen, as he later recounted, was so astounded at this uncanny knowledge that it needed half an hour to restore him. It had never occurred to him that the movements of the *Matunga* and the nature of her cargo had been reported to us by himself.

The *Matunga* carried many passengers, including a number of Australian soldiers and two military doctors, the senior of whom, a Surgeon-General named Strangman, was to be deputy-governor of Rabaul. He was now compelled to slightly alter his plans. His fellow-passenger, **Oberstabsarzt* Flood, was accompanied by his wife, the latter being attended by an English stewardess named Maria, who was by no means the most beautiful of her sex. From the moment she set foot aboard the *Wolf*, Stewardess Maria became "Maria Stuart."

The Australian officers and other military persons were at once transferred to the *Wolf* and placed under armed guard; the remainder were temporarily detained aboard the *Matunga*.

Captain Donaldsen also appeared.

[Here follows a typical dash of 'local colour,' probably affording great amusement to Nerger's hundred-thousand German readers. Australians who were present when Captain Donaldson boarded the pirate, emphatically brand this monologue as mere stupid invention. However, to set down the story as it is written.]:—

His first remark was: "Where is my cabin?" His second: "Do not forget to bring over the cases of champagne I have yonder; why should we drink monotonous tea when we can have champagne?"

The *Burrows* puzzle was now solved. He was no American destroyer, but captain of the former German station-yacht *Komet*, now re-named *Una* by the English.

The *Matunga* carried what (for us) was a very valuable cargo. Of this I need but

mention 3½ tons of frozen meat, great casks of fish, a quantity of spirits (which served us until we arrived home), all kinds of machinery, both complete and in parts, and many articles of toilet use which we had painfully missed for a long time.

In a word, she was just the sort of steamer we needed.

In addition to all this we obtained 800 tons of coal, including the 500 tons of beautiful Westport.

Then there were tin boxes, which served us for the keeping of deeds and documents, and zinc boxes which we utilised for laundry purposes.

Everything was of some use.

Wire netting, when covered with sailcloth, played an important part in the construction of cabins in which the passengers were to live. Three horses which were found aboard the *Matunga* were slaughtered and consumed by our officer-prisoners. I had the horseflesh served up to them as Mock Hare and as †*Sauerbraten*, and it was not until they had finished eating them that I told them of my little joke.

The prisoners taken from the *Matunga* were: the advised-by-wireless Captain Donaldsen; the future Governor of German New Guinea, Strangman, who had to content himself with the *Wolf* as Residency; Surgeon-Colonel Flood and his wife, three English captains, and Stewardess Maria.

The *Matunga* was too slow for me to have brought back to the Homeland, so we took her west, into a sheltered bay, and here the *Wolf* finished off his prey, leaving no scraps.

The *Matunga* was picked clean; all kinds of useless articles which it was considered undesirable to throw overboard were packed into her. She was then sunk.

The discharging of her cargo occupied about a fortnight; meanwhile a large number of cabins were built on the *Wolf's* searchlight deck from all manner of possible and impossible materials.

At last the *Matunga* was emptied and stripped. We then brought her in front of the bay, to a place where she could not be a danger to shipping (!), and sank her.

Of the remainder of this book very little need be added. Later chapters describe the raider's voyage in the Malay Archipelago, the laying of her last mine off Singapore, the capture, in the Maldives on September 27, of the Japanese steamer *Hitachi Maru*, which sent out wireless distress calls and was fired upon by the *Wolf*, twenty of the Japanese crew being killed and a large number wounded and drowned. His subsequent visit to this scene of carnage is disposed of by Nerger in the following words:—

On the Japanese deck lay the work of our shells . . . huge pools of blood everywhere! All was photographed.

*Literally: Colonel-Doctor.

† Literally: "Sour roast."



Die Wolfmannschaft in Berlin. Der Zug passiert die Linden. An der Spitze Fregattenkapitän Nerger.



Empfang der Wolfmannschaft in Berlin. Die Kaiserin mit den Kronprinzenöhnen,

Heroes in Their Own Country.

Two photographs emphasising Germany's approval of the Raider's high-seas piracy.

- (1) "The crew of the *Wolf* in Berlin. The party passing the Linden (Berlin's chief thoroughfare). At the head is Fregatten Kapitän Nerger."
- (2) "Reception of the *Wolf*'s crew in Berlin. The Kaiserin with the sons of the Crown Prince."

Next towards Mauritius and thence to Durban; here, in November, was taken the neutral (Spanish) steamer *Igotz Mendi*, carrying 7,000 tons of coal from Delagoa Bay to Colombo. This vessel accompanied the pirate back to Germany, a prize crew being sent aboard and a series of subsequent meetings between raider and prize being effected, on the high seas, for coaling purposes.

The Japanese commander disappeared from the *Wolf*, and is said to have committed suicide by jumping overboard when nearing European waters.

On November 30, 1917, while off Cape Agulhas, the raider celebrated the anniversary of her departure from Germany by sinking the American barque *John H. Kirby*, bound for Port Elizabeth with a cargo of 270 automobiles, "which were to have been used by the English against our native troops in East Africa."

December 14 finds her in the South Atlantic, sinking the French sailing vessel *Maréchal Davout*, and stealing therefrom "a quantity of wine, besides some pigeons and a beautiful pig!"

December 20, rendezvous with her consort, east of Trinidad, where, according to Nerger, it was intended to overhaul engines. This, he declares, would have proved disastrous for him, but for an intercepted wireless message, in Portuguese, from the Chief of Staff of the Brazilian Navy to the military commandant at Trinidad. Thus apprised that the island was now under military occupation, the pirate at once turned tail.

A second chapter of Christmas and New Year celebrations, followed on January 4, 1918, by the sinking of the *Storo Bröre*. In this episode Nerger boasts that he flew the British flag at the *Wolf's* masthead before ascertaining that the smaller vessel was not a neutral. This was the last of his victims, and the concluding pages of his book deal with storms in the North Atlantic, the journey to Iceland, back into the North Sea, and, finally, the return to Kiel after a voyage set down as having occupied 451 days, and covering a distance of 64,000 nautical miles.

In closing the story of the *Matunga* from the German buccaneer's point of view, it is instructive to read his com-

ments on the alleged treatment of prisoners taken by the *Wolf*, particularly when contrasted with statements made by the actual prisoners.

The international regulations for the treatment of prisoners (says Fregatten Kapitän Nerger) were at all times observed, the prisoners being provided with electric light and ventilation (in the tropics), also mirrors, carpets, washstands and similar articles, which we had taken from other vessels. The food was good and plentiful, and the prisoners suffered no disadvantage.

On account of the limited space available it was necessary for the English stewardess to share a room with a Chinese woman, a Mauritius woman and her small child. She requested me to make other arrangements, as she did not wish to be brought into close contact with coloured persons; but I was reluctantly compelled to refuse my permission.

So much for the German version.

Consider now the story from the prisoners' point of view, and the following testimony of Mr. Robert Sharland Taylor (of Wanganui, New Zealand), former wireless officer in the *Matunga*.



Mr. Robert Sharland Taylor, Whose Experiences Aboard the "Wolf" and in Germany are Related Below.

SEVEN MONTHS ON A GERMAN RAIDER.

Everyone knows (says Mr. Taylor) that Germany's trump card in the Great War was the destruction of the British Mercantile Fleet, or its reduction to such dimensions that the continuance of the war by Britain and

her Allies would be rendered practically impossible. To this end the German Admiralty devoted all its energies, first, by the construction of a vast fleet of submarines, and secondly, by the equipment and despatch of merchant ships, heavily armed, for raiding purposes. Of several ships of this latter class sent out from German ports, only two had any degree of success: the *Möwe* and the *Wolf*.

The *Möwe* was a fast ship of some 5,000 tons, and capable of doing twenty knots; the *Wolf* was considerably larger, but her speed was only ten, all out. The former was out for raiding purposes only, and, being speedy, could afford to make things pretty warm, for if danger were suspected, she could quickly shift to another quarter.

The *Wolf*, on the other hand, did not confine herself to raiding; she had another mission just as important—the mining of some of the principal ports in the Indian and Pacific Oceans.

Therefore, to successfully carry out this programme, she had to adopt less aggressive tactics, capturing a ship today, another in a month or so. By following this policy, it is not surprising to learn that her presence in these waters was not ascertained until some months after she commenced operations. True, mines were discovered off Colombo shortly after they were laid, and an enemy ship suspected of being in the vicinity; but shortly after this a ship was caught laying mines in the Gulf of Aden, and sunk by one of our ships. This, however, was the *Turritella*, the first ship captured by the *Wolf*. She was manned by a prize crew, mines were put aboard, and she was sent to the Gulf of Aden to lay them. It is very doubtful if our people found out who she really was, and if they had managed to rescue any of the prize crew no information would be obtained from them; thus it is quite natural that the *Turritella* would be credited with having mined Capetown, Colombo and Bombay.

Meanwhile, the *Wolf*, failing to find the *Turritella* at the appointed place and time, and scenting danger, made her way out of the Indian Ocean with all speed.

Some months later it became evident that another raider was nosing about,

probably after the capture of the *Matunga*;—that's where I come in. Needless to say, the idea of meeting a raider a few hours out of Rabaul was one of the last things that occurred to me; moreover, I had other reasons for regarding everything as being pretty safe in those waters.

The story of the *Matunga's* capture has been told many times, and hardly bears repetition. Suffice it to say that the prospect, after finding myself a prisoner aboard the *Wolf*, with some 200 others, some of whom had already been aboard for five months, was not particularly rosy. We were not long in finding out her history; she had been out from Germany nine months, and besides mining the places I have already mentioned, had laid fields off the New Zealand and Australian coasts; then I remembered the *Cumberland* and the £1000 reward.

I cannot look back on those seven weary months aboard the raider without a shudder when I contemplate what would have happened had we ran foul of a British cruiser. The *Wolf* would certainly have shown fight; her seven six-inch guns and her four torpedo tubes were not mounted for ornamental purposes. There would have been only one end, however, for, on account of her slow speed and inability to manœuvre, she would have been comparatively easy prey; our fate in that case would have been the most terrible death imaginable.

Our troubles were added to by the conditions of our existence. Most people have seen down a ship's hold—not a very inviting place to spend a quiet seven months, I assure you; and, moreover, *the food was awful, both in quantity and quality, and water was at a premium.* Being in the tropics for about six months out of the seven, we had a perpetual thirst, and *the Germans, who, on many occasions, had tried to break our spirit by making our miserable existence a hell,* gave us just sufficient to keep us alive.

Our worst time was spent in the Java Sea, on our way to mine Singapore. During the day we were lucky if we got an hour on deck, as alarms were frequent, and immediately one sounded we were sent below and battened down while we waited in suspense, expecting her to open fire every minute. At night we were bat-

tened down at sundown, and left to find a place to lie down in pitch darkness and intense heat. *Conditions at times became so bad that we almost prayed for something to come along and end our misery.*

During all this time we lived in hopes that the raider would be forced to intern in a neutral port for, until the *Igotz Mendi* was captured, the *Wolf* had not enough coal to take her to Germany.

On the capture of this ship, with a big cargo of coal, our hopes fell below zero, none of us believing that she would successfully run the blockade in the North Sea.

Wonderful though it may seem, however, we did not have one alarm after crossing the Western Ocean tracks. An attempt was made to force a passage to the north of Iceland, but, on account of the icefields encountered, the idea was abandoned, and the passage made to the southward, and across to the Norwegian coast, making the latter about 68 degrees north.

The remainder of the journey to Kiel was entirely without incident, after a voyage lasting 15 months, and covering a distance of over 60,000 miles.

Needless to say we were glad indeed to find ourselves on dry land again, even though it were enemy soil, for some of the prisoners had been aboard for over twelve months. Some were suffering badly from scurvy owing to the lack of fresh food—70 odd being sent ashore to hospital with the disease.

All the captains, officers and engineers, including myself, were sent to Karlsruhe—a distribution camp for prisoners—and finally I was drafted to Brandenburg, near Berlin. I shall not easily forget my first night in that hell. We had marched five miles from the railway station to the camp, carrying what remained of our belongings, and arrived in an utterly exhausted condition. The exertion, after such a long period of inaction, proved too much for one of our number, a Japanese officer of the *Hitachi Maru*, and he finally succumbed.

On our arrival in the camp we were bundled into a tiny barrack about ten feet square, without food, light, bed or blanket. The cold was intense, snow was on the ground, two paneless windows, criss-crossed with barbed wire, admitted

a wind that chilled us to the marrow. In the morning we were released and allowed to join the other prisoners in the camp. As we held officers' ratings we were not compelled to work; that was one blessing!

Then followed a period of starvation lasting three months, while we waited anxiously for our relief parcels of food to arrive from England. The day they arrived was a red letter day for us, as also was the day I received my first letter from my home in New Zealand, which arrived after a weary wait of eight months.

On November 23rd, twelve days after the signing of the armistice, about 600 of us left Brandenburg on our way home. We entrained for Ruhleben, where we spent the night, thence to Sassnitz in the Baltic, where we got aboard a Danish steamer for Copenhagen and Leith, Scotland, and finally to London.

As one may suppose, our life in camp was extremely monotonous; there were few forms of amusement, and we were obliged to fill in time as best we could. Occasionally, however, we were permitted to visit Brandenburg in order to bring our relief parcels from the local post office to the camp. This was done by means of a waggon, which we were compelled to draw by hand to and from the post office, a distance of about eight miles, a team of about twenty Britishers taking the place of horses.

At this time the Germans did not interfere with us a great deal, although at times they found petty excuses for inflicting various kinds of punishment on us, a favourite method being to "strafe" our parcels of food when they arrived, by opening tins of bully-beef, milk, jam, etc., and mixing the lot together.

Later, however, they became very docile, no doubt on account of England's repeated threats to take reprisals against German prisoners in England. This attitude became very marked just prior to, and after, the signing of the armistice.

Many prisoners on working parties and *kommandos*, however, suffered greatly. They were compelled to work long and hard, being continually subjected to ill-treatment by their brutal sentries. Many, unable to work at the required speed

owing to the lack of nourishment, were kicked and knocked about unmercifully. Sentries in charge of working parties receive a bonus according to the amount of work done by the prisoners, thus it is not surprising to hear of a sentry ill-treating a prisoner in order to get the last ounce out of him, thereby supplementing his meagre income by a few *pfennigs*.

We managed to keep in touch with happenings in the outside world. The German newspapers gave us very little information, and what they did give we learned to digest with the proverbial grain of salt. English newspapers, however, were smuggled into the camp regularly, so that right up to the signing of the armistice we knew pretty well how things were going.

This last piece of news was received quietly; there was no singing or cheering, no demonstration whatever; we all thought it time enough to cheer when we got across the frontier.

On November 23rd, 1918, the first party of Britishers, myself among them, left Brandenburg, *en route* to England, and as we marched through the streets of Brandenburg, crowds collected on the sidewalks, and watched us go by in much the same manner as a crowd views the passing of a large funeral procession.

That night we detrained at Spandau, and spent the night in the famous camp at Ruhleben. Despite all that has been written of the horrors of Ruhleben, we found it to be a palace compared with Brandenburg.

Next day we entrained again for Sassnitz, in the Baltic Sea, arriving after 20 hours' journey in a ramshackle fourth-class carriage with all the windows stove in.

At Sassnitz we waited three days for a ship to Copenhagen; during that time we were taken charge of by the Danish Red Cross, who provided us with white bread, also tobacco and cigarettes. I cannot speak too highly of the treatment received at their hands, both in Sassnitz and aboard the Danish steamers which took us to Copenhagen and Leith. On our arrival in Copenhagen we met with a magnificent reception, thousands turning out to welcome us and see us off again.

Arriving at Leith another great reception awaited us. Every arrangement had been made for our arrival, and within a couple of hours we were all on our way to our respective destinations.

Five days later I was sent to Liverpool, and here joined the steamer *Leicestershire* (Bibby Line), sailing for Australia on December 9, and arriving January 26th of this year.

* * * *

THE MATUNGA'S OWNERS.

Consider, finally, an aspect which seldom, if ever, enters the public mind, *i.e.*, the owners' point of view.

The *Matunga* was owned by Burns, Philp & Company, Limited, of Sydney, and the story of how these gentlemen faced the loss of their vessel is well worthy of attention.

The *Matunga*, as has been shown, while within a few hours' sail of Rabaul, had wirelessly to her local agents advising her expected arrival on a certain date. With her non-appearance at the specified time, the local agents wirelessly to the Sydney owners.

The *Morinda*, of the same Company, was then on a voyage from Rabaul to Papua. She was at once recalled by wireless and despatched in search of the missing vessel. For a fortnight she thoroughly scoured the neighbouring islands, but no trace of wreckage was seen. It will be remembered that the commander of the *Wolf* had, to repeat his own words, sunk the *Matunga* "in a place where she could not be a danger to shipping." The shrewdness of this action, which he attempts to explain as one of humanity, now becomes self-evident, while the same may be said of his extreme caution in throwing nothing overboard.

Returning to Sydney at the end of her fruitless quest, the *Morinda* was at once replaced by another B.P. vessel, the *Marsina*, which carried the search some hundreds of miles further than her predecessor. Meanwhile the military governor of Rabaul, General Sir Samuel Pethebridge, whose interest in the fate of General Strangman and Colonel Flood can well be appreciated, had issued instructions to native and local craft to make every possible investigation, but although these efforts were maintained for many months, nothing was found which could suggest a

tangible explanation of the disappearance. One of the many theories advanced at this time was that the vessel, during some seismic disturbance, had been drawn under and engulfed. That a German raider had visited these waters was never for one moment imagined, indeed so little apprehension had been felt by her owners that the *Matunga* carried no "outside" insurance. The route was considered perfectly safe and, by her loss through "war risk," the Company's policy covering "ordinary risk" failed to operate.

The first definite news to reach Australia was a cable message from Great Britain, announcing that the *Matunga* had been captured by the *Wolf*, but this was more than six months after the actual loss. Meanwhile the owners of the vessel and the dependents and relatives of those who sailed in her had remained in the gravest suspense and anxiety.

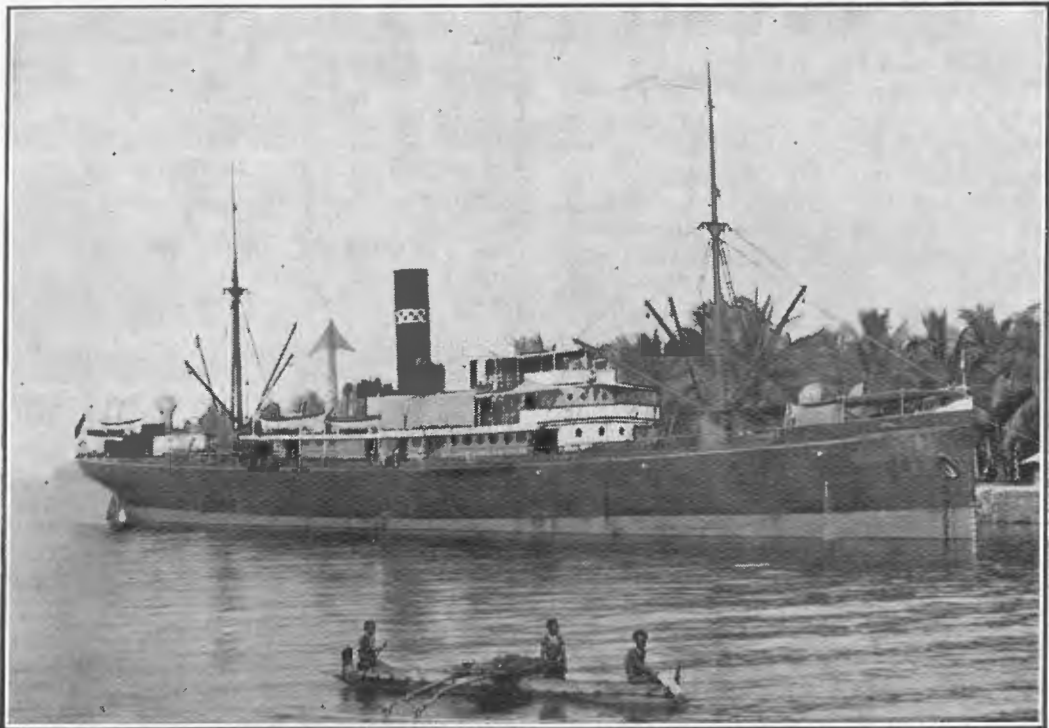
In this connection it is gratifying to note that Messrs. Burns, Philp behaved with the utmost generosity, full wages being paid to the 44 officers and crew from the date of their departure from Sydney.

To those who elected to "sign off" in England full payment was made to that date, covering, of course, the entire period of their captivity in German hands, a total interval of one year and four months.

To relatives and dependents a similar liberality was extended, and at Christmas a special allowance was made, over and above the wages due to their menfolk. Nor is this all. Several large subscriptions, approximating £1,000, were received from the Company by the Red Cross Society, these sums to be expended in financial aid and in the purchase and supply of comforts, food parcels, clothing, boots and other requirements for the *Matunga's* prisoners in Germany.

Mr. Taylor does not appear on the B.P. pay-sheet, having been "loaned" to the Company by Amalgamated Wireless (Australasia) Limited, but we are pleased to learn that the last-named Company's treatment of the *Matunga's* wireless officer was no less handsome than in the case of Messrs. Burns, Philp.

Happily for all concerned, the loss of this vessel was attended, so far as can be



S.S. "Matunga" at Papua. Photographed a Few Weeks Prior to Her Loss.

ascertained, by only one minor casualty; this occurred in Germany, a member of the *Matunga* crew suffering an accidental injury to his foot while working on the railways.

Returning again to the owners' point of view, it is the fact, although perhaps not generally known, that Messrs. Burns, Philp are bound by contract with the Commonwealth Government to maintain regular services between Sydney and a number of Pacific groups. With the loss of the *Matunga* the Commonwealth Government insisted on her immediate replacement, at the owners' expense, by another steamer, while stipulating that she be equipped as closely as possible to her predecessor.

To comply with these conditions the *Melusia* was purchased at a cost of £60,000, with the further expenditure of some £20,000 for alterations required by the Government.

Sailing under Government subsidy, the rates for freight and passengers are not augmented to any appreciable extent during the war; thus, while vessels in other employment were receiving double, and even treble, amounts as compared with pre-war rates, the Burns, Philp service did not benefit to a like extent.

The Company, through its London office, has lodged a claim of £100,000 against the German Government for the illegal and unlawful sinking of the *Matunga* and the capture of her passengers. It has been represented to the proper authorities in Great Britain that the whole of a very valuable cargo was seized by the raider and that the Company's losses, in replacing the vessel and in equipping and maintaining search steamers for possible salvage operations, were very heavy.

It is to be hoped that this claim will eventually be honoured, even if only in part, for while it appears unlikely that the entire loss will be recovered, it is gratifying, nevertheless, to learn that this special claim has been entered; thus supporting the Imperial Government in its present action regarding submarine losses.

THE WIRELESS MESSAGES.

Surprise will naturally be felt that the wireless messages which figured so prominently in the loss of the *Matunga* were

sent in plain language, particularly in view of the fact that every large shipping company possesses its own private code. It should therefore be explained that a Government order prohibiting the transmission of any wireless message *except* in plain language was in force at the period under review, and that no vestige of blame in this respect can possibly be laid upon the owners.

That this order was directly responsible for the capture of the vessel can never for one moment be denied or doubted, but no useful purpose can be served, at this late hour, by labouring so obvious a point.

* * * * *

THE "MATUNGA'S" SKIPPER.

Captain Donaldson Returns to Sydney.

On Tuesday, February 25—some few days after the foregoing narrative had been written—the steamer *Barambah* brought back to Sydney the commander of the luckless *Matunga*, Captain Alexander Donaldson. He was accompanied by his former purser, Mr. A. W. Pyne, and by the latter's assistant, Mr. H. Smith; also by three of the *Matunga's* firemen and the chief cook.

As officers and crew stepped ashore at No. 1 Wharf, Woolloomooloo Bay, after an eventful absence of one year and seven months, every vessel of the Burns, Philp fleet then in harbour emitted a friendly welcome on her siren, while the occasion was marked by a reception ceremony, performed at the wharf by the State Commandant, Major-General Lee, and the Naval Transport Officer, Commander Dunn. The *Matunga's* owners were represented by Mr. Baker, of the Island Department, Captain Green, Marine Superintendent, and Mr. Snellgrove, the Company's Superintending Engineer.

The travellers looked happy and fit, showing no traces of the privations which they have suffered in enemy hands; indeed, Captain Donaldson told the writer that he had put on flesh and ventured the opinion that short rations are sometimes beneficial to the health.

Of his actual experiences in Germany and aboard the raider Captain Donaldson would say but little. On disembarkation from the *Wolf* he was taken first to Heidelberg, then, in turn, to Karlsruhe and Uchtermoor prison camps where he sub-

sisted almost entirely on Red Cross parcels. He describes the prison fare as being terribly poor in quality and scant in quantity, and chief among his outstanding recollections are the bread, which he analyses as "75% potato and 25% sawdust," coffee brewed from acorns, and tea, for which no description can be found.

Armistice Day found him freezing in a

prison camp somewhere near the topmost peak of the Hartz Mountains.

To the writer's request for a photograph of himself for reproduction in this *Journal*, Captain Donaldson remarked: "Thanks, but I'd rather not," Mrs. Donaldson explaining her husband's modesty in these words: "Did you ever meet a Scotchman who didn't hate publicity? and Alec's very Scotch, you know!"

RUBBER INDUSTRY IN AUSTRALIA

BY OUR MELBOURNE CORRESPONDENT.

In the last number of *Sea, Land and Air*, Mrs. Selwyn Lewis, B.Sc., discussed that portion of the rubber industry concerned with natural production and carried the reader up to the stage where the article was in a finished stage, or, to be more definite, where it was ready to leave the estate factory for the sea board for over-sea transportation. It leaves the plantation factory in the forms of "biscuits," "smoked sheet" and "blanket crepe" and is packed in chests, which for general purposes may be likened to tea chests. Much of it is retained at the port of shipment pending auctions by local brokers, whereas a proportion goes direct over-sea and is placed on the markets there existing in the ordinary way. The rubber sales are held at regular intervals, weekly, fortnightly or monthly as may be the case. On arrival at, say, Melbourne, delivery is taken by the firms or dealers to whom it may be consigned and by these disposed of in due course to manufacturers who prepare the finished articles of commerce.

At South Melbourne are situated the great works of the Dunlop Rubber Company. These are easily the largest of their kind in the Southern Hemisphere, and compare favourably in up-to-date equipment with any rubber manufacturing works in the world. They cover no less than 600,000 square feet of floor-space and give employment to over 1,600 people. In them are to be found various machines equal in capacity and size to any in the United States, or the world for that matter. These

mammoth pieces of machinery are used for the treatment of rubber and duck, a process to be later referred to in some detail. It is interesting to record that at the Dunlop works the annual output exceeds 2,000 tons of finished goods.

On the arrival at the works of the cases containing the crude rubber they are opened and the rubber stored in special quarters. The first stage it then undergoes is cleansing, which is now a not particularly arduous task owing to the improved methods of treating the latex in the estate factories. In the old days this cleansing work was a serious business, involving what was known as "a trip'e process," when the virgin rubber then arriving in more or less bulk form had thus to be treated to remove the impurities that had been gathered up in the primitive forms of collection at the time in vogue. In the cleansing the rubber is passed through rollers at a great pressure, and it is then ready to take its part along with other substances, thus forming a crude foundation of the ultimately fine-finished rubber article of commerce. This leads to what is termed "mixing," by which is meant the compounding of chemicals and rubber in various grades. The art of the manufacturer steps in at this point in the preparation of the article for its final use. Rubber articles in use are frequently brought into contact with various forms of foreign matter, many of which are detrimental to the life of rubber, while others are sympathetic or may be said to act as preserva-

tives. For example, certain oil are practically a solvent of rubber, such as benzine and naphtha, whereas others, such as animal fats, are detrious to rubber, but are not solvents. This is demonstrated in milking machines, in which rubber is extensively employed. To contend with the fatty elements of milk, also for the effects of daily sterilising, the utmost purity is essential, so all rubber used in milking machines is absolutely pure, or only a degree or two removed from absolute purity. There are certain lines manufactured which are designated "heavy" and one may be taken as an illustration.

Vulcanised Belting.

The manufacture of vulcanised belting forms a very important department at the Dunlop works. The up-to-date methods of handling material such as quartz, iron ore, phosphate, coal, and wheat besides numerous other articles, by the conveyor and elevator systems, have led to a heavy demand on the company's resources for the production of vulcanised belting. For many years past the department entrusted with its manufacture has not been idle. Large conveyor belts to the extent of four-and-a-half tons nett weight each have been shipped from the South Melbourne works. The vulcanised belting—made by the Dunlop Rubber Company—on actual results has proved itself equal, if not superior, to any imported. On account of this an explanation is to be found for the exceptionally heavy demand for this class of output. Take wheat heading with the continuous belt, the company has received from the New South Wales Government an initial order for the full supply of vulcanised belting, an aggregate total of 60,000 feet. It will be employed in handling wheat in bulk at country silos and shipping terminals. From the huge belt 48 inches wide, to be seen in process of manufacture, belts are produced in varying degrees of width down to the miniature two-inch driving belt for small machines. In the manufacture of vulcanised rubber high-grade, special-woven belting duck is employed. This duck is first treated by the process known in the trade as "frictioning," which is really a method of impregnation of the duck to ensure absolute adhesion of plies. According to the size and grade of the belt the number of plies necessary are built up.

The body of duck thus formed is now fitted with top and bottom, special wear-resisting covers and specially prepared edges. The belt is then passed into hydraulic belting presses. In these machines a mechanical contrivance is fixed for taking the stretch out of the belt and it is while under this stretching process that the belt is vulcanised. By this method troubles of belt stretching while in use are obviated. When the belt leaves the press from vulcanising it is rolled on circular drums round which the shipping crate is built. The next step is to the lorry and then to the vessel or railway waggon for despatch.

Hard Rubber or Ebonite Goods.

That section of the works wherein are made receiving cases, ear pieces, mouth pieces and other telephone parts is highly interesting. This industry has been localised by the Dunlop Company. Hitherto the Postal Department looked to overseas supplies and the fact led the company to settle down and study this branch of manufacture, with the result that users of the telephone can now handle a receiver with the knowledge that the entire casing is locally made. The establishing of an industry such as this may be looked upon as a triumph for Australian enterprise. Experts in the Postal Department have declared the locally-made article to be superior to anything imported. The class of material used in this branch, known as ebonite, creates a big demand on the company's resources in the form of sheet rod and tubing employed in electrical, wireless and various other industries. Large quantities of it are despatched to Sydney for the use of the Navy Department.

General Rubber Goods.

Thousands of various articles are made in rubber at the Dunlop mills, so that it is practically impossible to deal with this huge industry in summary form. The leading lines of manufacture cover engineering and mining goods, steam, suction, air, garden and various other special hoses, motor, vehicle and cycle tyres, waterproof garments, rugs, mats and in-laid matting, rubber heels and soles, sporting goods. In fact the slogan of the Dunlop Company is "Everything made in Rubber."

AERIAL AUSTRALIA

Epecially Written for "Sea, Land and Air"

By TED COLLES (A.I.F.)

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PART II.—Continued from Previous Issue.

People, sufficiently interested in the development of aviation to try and see beyond its present phase of danger and destruction, are beginning to consider in what ways, besides pleasure-rides, aeroplanes could be of use to private owners after the war; also, whether they will be financially "possible" to more than a few wealthy freak-owners.

Unfortunately, much surprising but convincing evidence on these points cannot be made available to the general public until the secrets of our war-time progress in aviation are less jealously guarded (for obvious reasons); and the ways in which much that is now manifested in abnormal mobility and amazing speed stunts will later be translated into increased stability and lifting strength for plain straight-flying, can be made apparent to everyone. And, as the writer previously pointed out, flying-school statistics, and the experience of thousands of our citizen-soldiers who have entered the flying service, are sufficient to show that under *normal* conditions flying is slightly safer than any other form of locomotion, and will certainly be used in state and privately-owned services after the war.

It is also a fact that, for the same amount of travel, the aeroplane need not be more expensive to keep than the motor car, as will presently be demonstrated.

However, it must be admitted that the back gardens of South Yarra or North Sydney will hardly allow of the construction of private landing grounds for their respective owners. But, with the safer and more simply-controlled machines that will come into use after the war, an area of five acres will be ample for all purposes; and there are no municipalities in Australia that could not supply such a public convenience in the same way that private enterprise now supplies an auto-garage for those who temporarily require one.

In big cities, of course, or in the neighbourhood of great industrial centres, where aircraft will be used for transport pur-

poses (the giant aeroplane's arrival is only a matter of time) landing grounds will be larger and more numerous, and just as necessary as the big railway yards and sidings on the outskirts of many cities and suburbs to-day.

As far as individual ownership is concerned it will be the man whose interests are in the open spaces of Australia who will benefit most from the possession of a machine in the near future. And this type of machine can be handled with safety after a few months' instruction. To such a man the question of accommodation and the selection of a safe landing ground will present no difficulties. The whole wide country will be at his selection, while for the owner living in the vicinity of a river, lake or bay, the substitution of floats for the running wheels on the undercarriage will further simplify the question of a landing place.

A machine whose running expenses are light will be of innumerable uses to such a man. And the possession of a conveyance that can take a station owner in a *straight line* to the nearest railway, or even to the market town itself, will sometimes mean the saving or gain of thousands of pounds. Also, a vehicle that can travel nearly a thousand miles between daylight and dark over the worst country, by being utilised to locate lost travellers, cattle, etc., will often be the means of saving lives as well as money.

The man in charge of an important inland exploration or prospecting party will actually be able to keep in daily touch, if imperative, with a base that, by reason of bad and waterless country, would otherwise be weeks of difficult travelling behind him.

In fact the possibilities of the aeroplane in the development of inland Australia are limitless. But to return to the subject of private ownership, the first consideration is the old question of cost. This will depend on the type of machine selected of course, although these will generally

develop along more economical and useful lines than at present, when everything aeronautical is at a premium on account of heavy war-time demands.

The most suitable type of machine at present in sight, for the purposes enumerated above, is a two or three-seater, of something above 100 h.p., and capable of a speed of 80 to 85 miles per hour. The cost of such a machine would lie greatly in its engine. Take an air-cooled V. engine, such as the Renault, for instance. This should cost something in the neighbourhood of £400 after the war. And a machine of the kind above mentioned should cost between £350 and £400, with instruments and accessories complete. Total cost of flying machine: about £800.

Such an aeroplane would be not too bulky, easy to operate, and, owing to its low engine power, reasonably cheap to run. It would consume about nine gallons of petrol and about half a gallon of lubricating oil per hour. And it must be remembered that in that hour from twice to twelve times the distance of travelling could be done in a 'plane than in a vehicle bounded by the positions of roads, hills, bridges, etc., and the general layout of the country. It is in these respects that the cost of operating an aeroplane can easily be proved less than that of a motor car. Also, barring serious damage through a careless landing, repair costs would be much lighter under normal usage (for, as the writer has pointed out in an earlier article, the aeroplane has not to stand the material frictions and vibrations that play the main part in the deterioration of vehicles travelling over solid earth), and when the country is furnished with the proper landing grounds necessary to cope with the coming aerial traffic, the breakages mentioned will be no more likely in aeroplanes than in motor cars. In any case, the likelihood of such mishaps could further be minimised by the employment of efficient mechanic pilots, in the same way that chauffeurs are employed to-day.

So, including the cost of a mechanic's labour, the running expenses of a two or three-seater, 100 h.p., private aeroplane can be brought down to the following cost per mile basis:—

Assuming an annual mileage of 11,000 miles; or a journey of 60 miles every second day, consumes petrol and oil at the re-

spective rates of nine gallons and half a gallon per hour.

	s.	d.
Petrol @ 2s. 6d. per gallon; oil @ 5s. per gallon	0	3½
Mechanic's salary at £200 per annum	0	5
Replacement parts and overhauls at £200 per year	0	5
		<hr/>
Total cost per mile	1	1½

And for this one-mile journey per air at 1s. 1½d. a 7d.-per-mile motor car might have to travel two miles, at a cost of 1s. 2d.

Besides the more economical developments that will occur after the war in the production and maintenance of aircraft, there are one or two other points that will greatly influence the private buyer in the value and type of machine that he will select.

For instance: if he knows that his machine will be mostly used in low, well-cleared country, with few hills and not liable to high winds, a much lower powered engine will be required than for country where great heights and fierce winds would demand steep and rapid climbs into the air.

Besides actual economy in fuel consumption, this would mean less tank capacity; the latter forming a large proportion of useless load, which has to be paid for in engine power. Also, the lighter the weight of the machine the less liability of damage through heavy landings; and a speedier and longer journey could be made on a given expenditure of petrol.

Now, when it comes to the actual selection of a machine from the builders, one of the first considerations should be simplicity—as well as efficiency—of construction. For instance: the many small complicated parts made of oxy-welded steel require expensive jigs for their production, and are neither cheap nor easily replaced. And in other ways simplicity also means safety and durability as well as economy.

As to details of construction, a wooden strutite or framework is the most serviceable at present for private owners. And although robust construction is a big point for consideration it need not be sacrificed on that account.

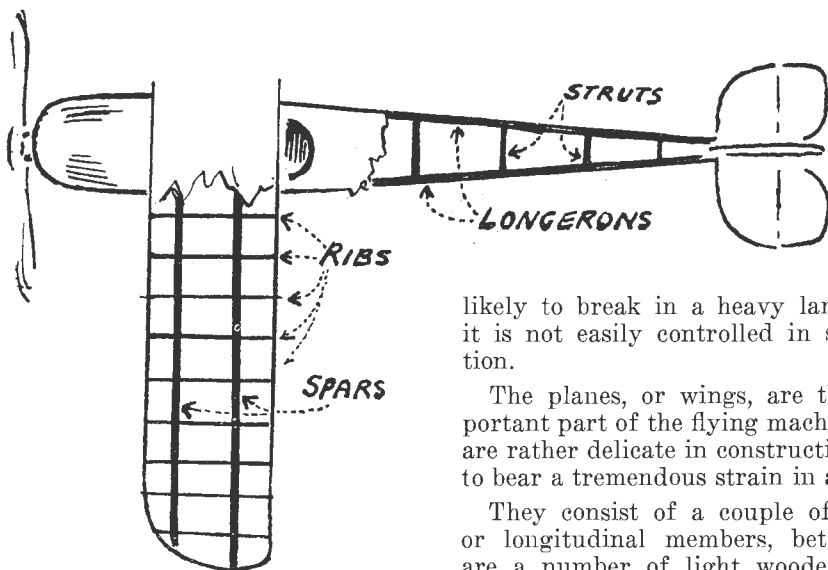
The longitudinal members of the fuselage, or body, should not have too many holes pierced for bolting, etc. As a chain

is only no stronger than its weakest link, so is a length of wood under strain no stronger than its most impoverished or least solid part. Hundreds of machines are faulty in this respect, although a complete fuselage frame can be built without any piercing of the longerons, or longitudinal parts. Running the whole length of the body of the machine, these are, of course, under the greatest strain. Also, the quality of the timber counts for much; soft wood having but one quarter of the life of a hard wood member. The writer has seen a spruce-built fuselage broken by the strain of merely lifting in an unbraced spot.

The undercarriage is the part that bears the weight of the entire machine when

shocks due to careless handling as well as properly proportioned wooden ones do. And for general use the V-shaped undercarriage is the best; it offers the least air-resistance in flight, and is strong and simple to replace. The tyres on the running wheels do not undergo much actual wear and tear, but in landing they have to stand shocks out of all proportion to their necessarily light construction; therefore, they should have a large diameter and be only of the best material and pattern.

The tail skid should be steerable, and connected with the rudder lines. It should not be placed too far back on the body, for then it bears little of the middle weight of the machine—in the part which is most



SKETCH OF AEROPLANE STRUCTURE.

standing on the ground, and it has to bear the shock of heavy landing.

It should be made of strong material, with plenty of spring, though not enough, of course, to allow a possibility of the propeller coming into contact with the ground. In this respect a clearance of at least a foot should be allowed with the machine in flying position. The attaching to the aeroplane's body should receive careful consideration, for it can so be placed that in a bad landing damages might be averted that would necessitate the re-building of half the body.

Many carriages are built of steel tubing. They are entirely satisfactory in very expert hands, but certainly do not stand

likely to break in a heavy landing. Also it is not easily controlled in such a position.

The planes, or wings, are the most important part of the flying machine, for they are rather delicate in construction, yet have to bear a tremendous strain in actual flight.

They consist of a couple of long spars or longitudinal members, between which are a number of light wooden ribs; and the whole frame is covered by a linen fabric. A special varnish converts the latter into a parchment-like material, which cannot easily be moved from the framework without being damaged. This may render the repairing of a broken wing part a very expensive matter.

This fabric covering, to be really durable, should be of the best Irish linen, made from flax, and the most important thing affecting its life is the quality of the "dope," or varnish. It is certain that when manufacturers begin to cater for the public market they will endeavour to undersell competitors with cheaper planes inferiorly varnished, unless the manufacturer is controlled by some compulsory standard of requirement. In

this case the private purchaser would have to watch this matter closely and insist on at least four coats of "dope," with a top-coat of elastic varnish, in the interests of ultimate economy as well as safety.

Light also has an injurious effect on the wing fabric covering. One method to obviate this trouble is the pigmentation of the varnish with some solid non-actinic colour, which renders it opaque to the destructive rays that would otherwise penetrate.

This coating is applied to the top surfaces of the wings, or planes, only. From its nature it cannot get such a polished surface as the unadulterated "dope," and smooth surfaces must be maintained as much as possible to minimise air friction, in the interests of speed and motive efficiency.

Incidentally, it is the forward-inclined

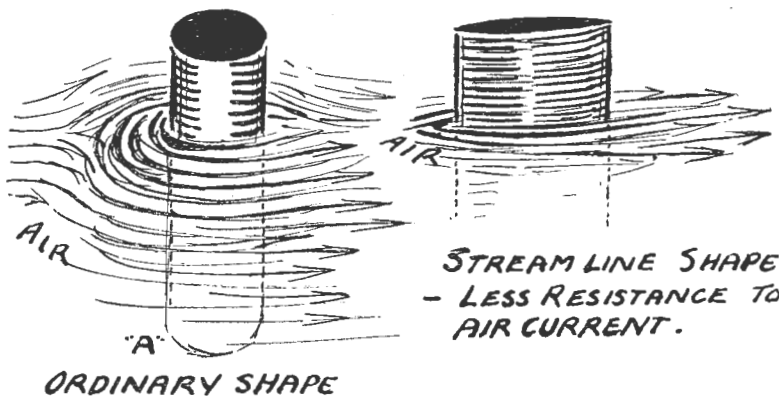


ILLUSTRATION OF ORDINARY AND STREAMLINE WIRES

under-surfaces of the planes that strike the most air resistance, the back or top surfaces being followed by a vacuum in flight through the air.

Another thing which once affected the durability of the planes was the attaching of the fabric to the framework by means of tacks; but this has been almost entirely superseded by a method of sewing, which damages nothing.

In view of the above-mentioned delicacy and expensiveness of plane construction, certain special attention should be given to the wooden structure before the frame is covered.

The spars should be only of the best-grained wood—preferably three-ply centres of ash, or birch, throughout; and the ribs should be made from carefully selected

ash. The use of cheap, soft wood in the middle plies is inadvisable. It eventually tends to quicker disintegration of the entire wing; and—it has been pointed out—that is no cheap item to replace.

In fact, taking the flying machine throughout, simplicity of design and excellence of material at the outset make for safety and great economy in the long run.

Now comes consideration of the wires used for bracing and strengthening the planes against the intense strain of air-pressure in rapid flight.

Much may be said in favour of the *raff wire, which is ordinary round wire flattened to a narrow stream-line shape to lessen resistance against the air.

Although this is comparatively a minor consideration in the general make up of an aeroplane, it certainly does make for low resistance in flight. But the private

owner would find that in event of breakage, an entirely new raff wire would have to be rolled and made to replace it; whereas ordinary stranded cable could be replaced by merely cutting a length from a roll kept for that purpose. So, for the private owner who would not keep a workshop on his premises, and to whom the fetish of excessive speed would

not be a first consideration, ordinary strong round wire would be the most suitable. But as this is also used in the important control gears, as well as the general bracings of the aeroplane, it should be selected only of the finest quality, and any sign of brittleness in the individual strands would be a sure sign of unfitness for further use.

Before going into details regarding aeroplane engines, it might be remembered that the writer claimed in our earlier article that the flying machine had been proved to be as reliable as the motor car—*under normal conditions*—by aviators whose wartime experience had also taught them its pleasant possibilities when put to more rational uses.

Now the reliability of any mechanism de-

* Presumably "R.A.F." (Royal Aircraft Factory).—Ed.

depends on the economy of moving parts that are liable to wear. And in the aeroplane the engine is the only part subject to continuous actual movements. Even then it is operating under conditions more favourable to long life than those that rule over earth-moving vehicles. For instance, it has an elastic drive, entirely free of joltings, for there are no road-shocks on non-solid air. Also it operates in an atmosphere free from dust and grit. While in the automobile there is the gear box, live axle and transmission, all moving at high speeds; all subject to varying torsions and load strains, according to uneven road conditions, and all working in air heavily charged with dust, etc. On the other hand, it might be thought that the lightness of an aero. engine is detrimental to its strength and durability. But it is a fact that the strength of its essential moving parts are never sacrificed to lightness; only the parts not liable to shock have been lightened—with intelligent attention to the proper distribution and use of material generally. And on comparing it with the auto. engine, it will be found that such parts as bearings, cams, gear wheels, etc., are actually stronger than in the other.

In selecting an engine, as in selecting the aeroplane, the private owner should consider the service most commonly to be required of it, for engines are becoming almost as varied as the types of machines at present in use. The rotary engine has certain advantages where short trips up to a hundred miles are to be the rule. It is self-cooling, and does not require the carrying of a great quantity of water; and together with the light weight of the engine itself, this allows of greater loads being carried over such distances. But when it comes to distances of 150 to 170 miles, the rotary engines' extravagance in fuel consumption begins to be felt. Otherwise, it excels in durability, inasmuch that it has an easy turning effort, and is not so susceptible to the effects of vibration as the stationary engine. It has a disadvantage in the delicacy of some of its parts; not that these are expensive to replace, but this means frequent taking down of the engine for replacements. And as the life of a good rotary engine between overhauls is about 48 hours of flying, or 3,000 miles of travel, this would necessitate about two periods of inactivity for two days in every five or six weeks, in which a skilled mechanic would attend to the dissembling

and the fitting of new piston rings, valve springs, etc. In regard to other replacements the rotary engine has no disadvantage in comparison with other types. But it might be mentioned that the dismantling of a rotary engine may be done in a little under three hours. And in an urgent, or public service, justifying the keeping of two engines, this might be an advantage, inasmuch that the machine need never be out of service on account of engine trouble for longer than that period.

Of the above types of engine the Monosoupape Gnome is about the best evolved to date. The working parts are simple and robust, and it is the least extravagant in petrol and oil consumption, and the most reliable. It has only the one valve for exhaust, and the petrol mixture is drawn into the cylinder from the crank case through a series of portholes. The disadvantage of air feed not being regulated by a throttle is not as great as might appear; for the privately owned aeroplane engine will be much like the motor boat engine in the plain, one-speed work that it will have to do. And fine variations of driving mixture will not be as necessary as in the motor car.

Another type of engine showing great promise, but not yet properly developed, is the radial engine. It is being constructed up to 600 h.p. water-cooled and 300 h.p. air-cooled. Petrol consumption is lower than in the rotary, for there is no power lost in revolving cylinders. The rotary loses about 10% of its power in this respect. In many other ways it promises to be a strong competitor with all other types at present in use.

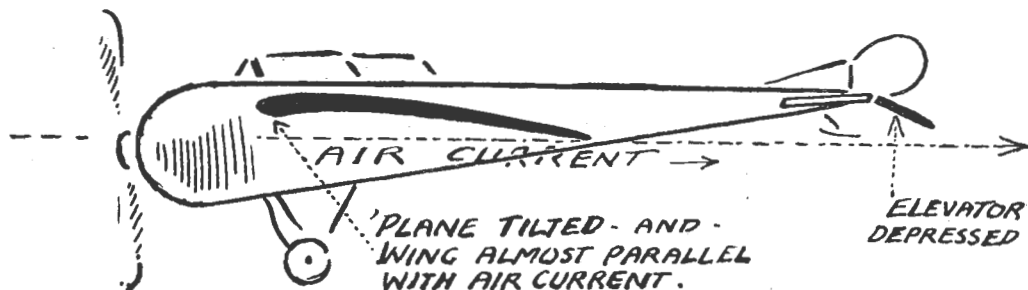
Of the vertical-cylinder water-cooled engine there are many patterns in use. This is practically the motor car type redesigned and lightened down for aeroplane use. It has a particular advantage of fitness for big machines. For the largest types of machines a special "V" engine has been developed. But the complication of multiple magneto and carburettor fittings and systems introduced precludes it from the consideration of the private owner, who will prefer his flying machine to be no more complicated, and requiring no more care than his old automobile has been in the past.

So, taking into consideration the advantages and disadvantages of the above-mentioned engines, in respect of their special purposes, it seems, as already pointed out,

that the ordinary eight-cylinder, V type stationary engine is the most suitable engine at present in sight for the private owner. Though rather heavy for the power developed—in comparison with the more "special" engines—it will do anything up to a hundred hours' flying without needing a complete overhaul. In fact, an engine—like the Renault, for instance—is perhaps more reliable than the average motor car engine. Also, the petrol and oil consumption is low, and the fact that the driving mixture is regulated by a throttle enables it to be started single

Now, having selected a suitable machine with a equally suitable engine, the next problem for the private owner is the housing of his aerial vehicle.

At present the large surface dimensions of an aeroplane preclude all hope of such simple accommodation as the home-built auto-shed, although folding wings have been in use for some time on certain sea-planes. And eventually this process will be generally applied to land-machines, in order to meet the convenience of public owners whose acres are limited.



handed, and, if necessary, to be flown at varying speeds without much attention to the elevator. For, the latter by being depressed, not sufficiently to deflect the aeroplane's direction downwards, but enough to tilt the plane surfaces forward to a position more parallel with the direction of progress, lessens the resistance of air pressure against the under surfaces, and thus increases the speed.

Finally, there is no water-cooling system to be bothered with. And provided a few simple precautions are observed, everything goes smoothly with this engine.

When this comes about, the private aeroplanist will be able to pack his pet machine into a garage no larger than a good sized auto-shed; together with such spare parts as top and bottom planes, a propeller, shock absorber, wire cable, bolts, nuts, turn-buckles, etc.

But the first phase of the coming age of public flying, for both pleasure and business purposes, will see this problem solved by the provision of private and municipally owned landing grounds and aero "garages" in various suburbs and townships throughout Australia.

CAPTAIN PHILLIPS OF THE "MAKURA"

Captain Phillips, for many years commander of Canadian-Australasian liner *Makura*, enjoys the somewhat rare distinction of having risen from "before the mast" to the position of commodore of one of our most popular liners.

His recent return to Sydney was made the occasion of a unique gathering of some forty of his one-time school chums, mostly prominent citizens, who had not met Captain Phillips in the last thirty years or more.

The reunion was held at the Wentworth Hotel on January 24, when a friendly "glass of grog" was taken and a number

of cordial speeches made, the chair being occupied by Mr. W. B. Scott Fell, the well-know shipping agent.

Captain Phillips was born on Sydney Harbour aboard the John Duthie line clipper, *Lumberman's Lad*, skippered by his father. The *Lumberman's Lassie*, of this line, was referred to in our last issue in an article by Captain J. H. Watson.

Captain Phillips' christian names are Sydney John Duthie and wherever he carries them he reflects nothing but credit on his Sydney birthplace and the vessel in which he first saw daylight.

THE ORIENT LINE

Especially Written for "Sea, Land and Air"
By CAPTAIN J. H. WATSON, J.P., F.R.A.H.S.
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The history of the Orient Line of steamships is a very interesting one, and the *raison d'être* of its existence carries the mind back to the days of the infancy of steam, as applied to sea-going vessels, when the 70-ton paddlewheel steamer *Argyle* made a voyage in 1815 from Glasgow to London.

From this first ocean steamboat voyage come all the attempts of shipbuilders and engineers, until in a century we have the magnificent liners which for the last four and a half years have been cruisers, hospital ships, and transports, without whose assistance the Allies could never have brought Germany to her knees.

Australia's connection with steamships goes back nearly to the same period, for in the *Sydney Gazette* of May 26, 1829, a line of steamers from Sydney to the Hunter River is advocated. The *Sydney Morning Herald* of February 25, 1839, reports a public meeting, presided over by Sir John Jamison, in the interest of steam communication with England. In England, and in Sydney, meetings were held with the same object in view in 1846-1847. These resulted in tenders being called by the British Government in September, 1848, for the conveyance of mails between Singapore and Sydney by steam vessels, the P. & O. Company already having a contract to carry them between London and Singapore. This was followed in January, 1850, by tenders being called for conveyance between London and Sydney, followed by a leading article in the *Times* pointing out that the necessity of a steam route to Australia was felt every day to assume increased importance. The P. & O. Company was first in the field with a contract, and the paddlewheel steamer *Chusan* opened the service by the Cape route, arriving at Sydney on August 3, 1852. But private companies, and other owners, had been studying the question of steam communication, independent of mail subsidy, and Messrs. Gibbs, Bright & Co. made the test with

the *Great Britain*, which was a financial success, that well-known steamer being a greatly patronised liner, principally between Liverpool and Melbourne, for over twenty-five years.

Not so fortunate were some of the companies, notably the General Screw Steam Shipping Co., which placed in the trade the *Argo*, *Calcutta*, *Queen of the South*, *Lady Jocelyn*, *Hydaspes*, *Indiana*, *Jason*, and *Golden Fleece*—steamers of 2000 tons. These, however, were not a success; they made long passages and had to be frequently coaled at places unprepared for the demand on their resources, which meant delay, and that expense.

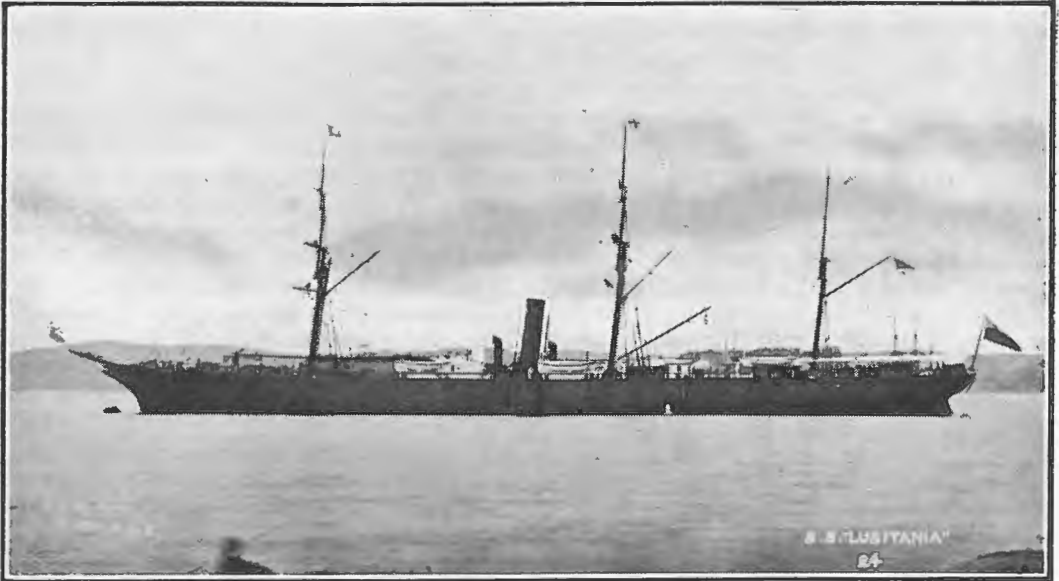
Then the Australian Royal Mail Steam Navigation Company built a number of large steamers to carry out a contract in 1852—the *Australian*, *Sydney*, *Melbourne*, *Adelaide*, and *Victoria*; but these, like the G.S.S.S. Co., proved failures. The latter Company became incorporated with the European and Australian Company, which carried on the mail service between Suez and Sydney for some time with the *s.s. Columbian*, *Emu*, *Jura*, *European*, *Oneida*, and *Simla*, but frequent breakdowns caused unpunctuality in both arrival and departure. This brought forth from the Melbourne Chamber of Commerce a strong protest respecting the mail service irregularities, addressed to the Postmaster-General, December 9, 1857. In a paper issued to Parliament it was shown that the penalties imposed on the Company during that year amounted to £17,200 for irregularity in delivery of the mails, which the following year was increased to £33,000. Financial difficulties brought this company, or companies—for three were mixed up in its intricacies—to an end, its steamers being disposed of to various buyers.

Steamers of the type of the *Royal Charter* (which was lost in 1859) and the *Royal Standard*, from Liverpool, of Money Wigram's Blackwall Steamships London (lost in 1865), *Somersetshire*, *Durham*,

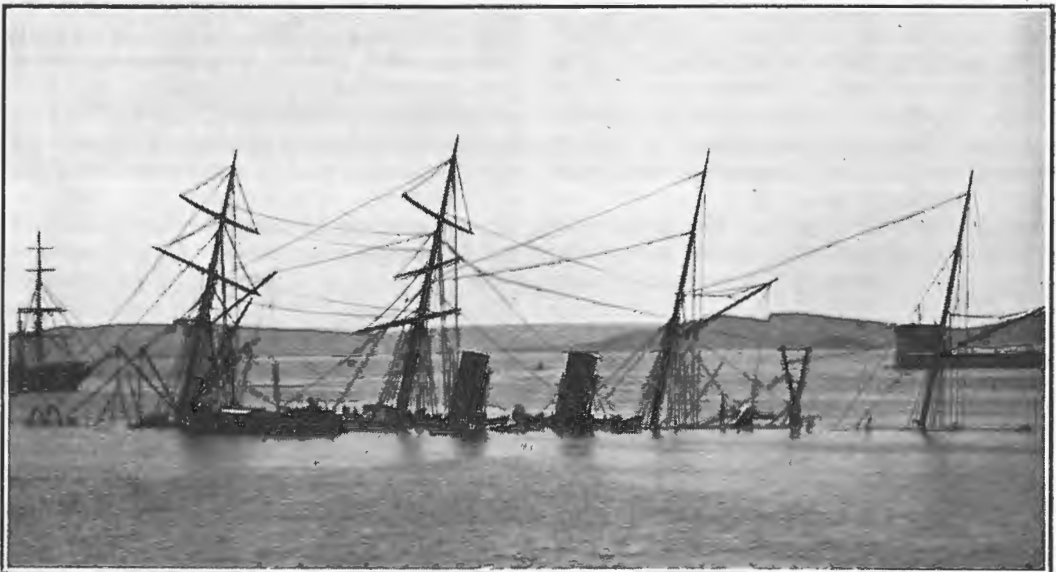
Northumberland, and *Hampshire* did not fulfil the requirements.

All these attempts and failures had attracted the attention of shipping people throughout Great Britain, and among them the firm of Anderson, Anderson &

Co., of London, a very old shipping house which had originally been established about 1825, by Mr. James Thomson, and carried on its operations chiefly in the West Indian trade. Later, Mr. James Anderson became a partner, and the name



Pacific Steam Navigation Company's s.s. "Lusitania," 3,825 tons, which heralded the advent of the Orient Line to Australia. Leaving Plymouth on June 28, she reached Melbourne, on her maiden voyage, August 8, 1877, and Sydney five days later.



Orient Steam Navigation Company's s.s. "Austral." On November 11, 1882, during her second visit to Australia, while coaling in Neutral Bay (Sydney Harbour), she sank at her moorings.

was changed to Anderson, Thomson & Co., and finally developed into Anderson, Anderson & Co., Mr. James Anderson successively taking into the firm three nephews. The firm's first connection with Australia was by a line of sailing vessels, which carried on trade between London and Adelaide, and the names of the ships of the fleet are well remembered in the Port to this day. They opened up with a London-built vessel of 1,200 tons, named *Orient*, from which the present great line of mail steamers takes its name. The *Orient* was built in 1853, and the following year, war having been declared by England against Russia, the *Orient* was taken up as one of the transports to carry troops to the Crimea. After the proclamation of peace, and the return of the troops to England, the ship was laid on for Adelaide, and arrived there on her first voyage in September, 1857. Among the vessels of the line were the *Coonatto*, *Murray*, *Goolwa*, *Yatala*, and others, which for many years frequented the southern capital.

To test steam traffic between London and Australia, Anderson, Anderson & Co. chartered two large steamers from Watts, Milburn & Co., and laid them on for Melbourne and Sydney. The first of these to arrive was the *St. Osyth*, 3,600 tons, which reached Melbourne December 24th, 1874, in 49 days from Plymouth.

Following these some steamers of the Pacific Steam Navigation Company were chartered for the service. This Company had been running its steamers between Liverpool and the West Coast of America since 1846, and at this time, by a rearrangement of mail contracts, several of them were available, and the *Lusitania*, *Chimborazo*, and the *Cuzco* came into the Australian trade.

These vessels were first mentioned in advertisements in Sydney papers as "The Orient Line of Steamers" in November, 1877. The first of them to take up the service was the *Lusitania*, an iron steamer of 3,825 tons, built by Laird, of Birkenhead, and launched in April, 1870. She left Plymouth on June 28th, 1877, and arrived at Melbourne on August 8th, Mr. James Dick, the chief engineer, giving the time as 40 days 6 hours and 10 minutes. The voyage was completed at Sydney on the 13th. Captain Hewison was in command,

and the Cape of Good Hope route was taken on the outward trip, but for the homeward Suez Canal was used. This became the custom of these steamers for some years.

The next vessel was the *Chimborazo*, of 3,816 tons, built near Glasgow, by John Elder & Co., and commanded, on her first two voyages to Sydney, by Captain John Vine Hall, a gentleman well known along the water front and on the wharves at the present time. Her first appearance here was on October 1st, 1877. She will be remembered best by an unfortunate mishap which befell her on March 14th, 1878, when, near the completion of her second visit to Sydney, she got on the rocks at Cape Perpendicular, the north head of Jervis Bay, an incident which provided much "copy," both literary and pictorial, for the newspapers of the day.

The following steamer was the *Cuzco*, another of John Elder & Co.'s build, which arrived at Sydney November 14th, 1877, and continued in the service longer perhaps than any of the other older vessels, not being passed out until 1905, when she was sold to an Italian firm.

It was at this time (the end of 1877) that the Orient Steam Navigation Company (Limited) came into existence; it was announced in the Press that this was controlled by Messrs. Anderson, Anderson & Co., in conjunction with Messrs. F. Green & Co., the well-known shipowners. The object was stated to be to take over the Orient line of steamships then running between England and Australia, and to develop steam communication between the two countries.

The evidence of how this has been carried out was to be seen in the magnificent steamers the Company had on the line up to the time the war broke out, and no doubt as soon as the shipping of the world comes into its own again, still greater vessels will be seen in Australian ports, assisting in developing Australian commerce.

The service was continued with the Pacific Steam Navigation Company's steamers, but instead of the vessels being chartered as before, their owners came in as partners.

The steamer which should have followed the *Cuzco* was the *Garonne*, but she was evidently not ready, and one belong-

ing to the Royal Netherlands Steamship Company had to be secured to fill the gap, this was the *Star Amsterdam*, of 2,836 tons, launched from the yard of A. & J. Inglis, of Glasgow, in 1874. She arrived at Sydney on December 24th, 1877, under command of Captain Boom. This steamer later passed into the ownership of a French firm, and was renamed *Ville de Marseille*.

After the *Lusitania*, *Chimborazo* and *Cuzco* had each made a second trip, the *Garonne* came on the scene, arriving at Sydney on April 27th, 1878, under command of Captain De Steiger, R.N.R.

This vessel was built by Messrs. R. Napier & Sons, Glasgow, in 1871, and was of 3,901 tons, and although by a different

The steamers have had long descriptions of them written as each one in succession reached her destination, and each has been the last word in marine architecture; with present day knowledge a comparison between the *Lusitania* of 1870 and her namesake, which was sunk by a submarine on May 7th, 1915, off the coast of Ireland, will show what immense strides have been made in ship construction.

Lusitania, built 1870:—379 feet 9 inches long, 41 feet 3 inches broad, and 3,825 tons. Her horse-power was: natural draught 550, and forced draught 3,000. She cost £91,852.

Lusitania, built 1906:—786 feet 6 inches long, 88 feet broad, and 33,000 tons. Her



The "Austral" Refloated. She was raised on February 23, 1883.

builder to the others she had a strong family likeness to them. They were all single funnel ships, with clipper bows and barque rigged, for sails had not as yet been discarded.

In giving the port of arrival, the terminal one, Sydney, is named. These ships, however, from the initiation of the service, have called at Adelaide, Melbourne and Sydney, and for some years, during its busiest activities, Fremantle in the West, and Brisbane in the East have been added by the Company.

horse-power, on a forced draught, 80,000, and her cost was about £1,250,000.

It was soon found that a monthly service did not meet public requirements. When it was brought home to the people that a line of steamers was making voyages with regularity and punctuality in about half the time that sailing ships took, this having been made possible by the Suez Canal, the sailer, for the bulk of travellers, was deserted, and the Orient Company found it had to double its vessels and works a fortnightly time-table.

With the assistance of the Pacific Steam Navigation Company this was accomplished in 1879, when several large steamers were brought into the line. Those best remembered are the *Aconcagua*, *John Elder*, *Liguria*, *Potosi*, *Sorata*, *Cotopaxi*, and *Iberia*.

The service was occasionally supplemented by outside steamers in similar circumstances that necessitated the voyage of the *Stad Amsterdam*, such as the *City of London*, in August, 1879, and the *Sultan* in the following month, but these occasions were rare. The order in which the steamers, of what may be termed the first stage, of the Orient Line, arrived are as follows: *Lusitania*, August, 1877; *Chimborazo*, October 1st, 1877; *Cuzco*, November 14th, 1877; *Garonne*, April, 1878; *Aconcagua*, July, 1878; *John Elder*, March, 1879; *Orient*, December, 1879; *Sorata*, April, 1880; *Cotopaxi*, May, 1880; *Liguria*, July, 1880; *Potosi*, July, 1880; *Austral*, January, 1882; and the *Iberia* later.

The *Sorata* was a steamer of 4,014 tons, built by John Elder & Co., in 1872, and made her first voyage to Australia in 1880. She arrived at Adelaide on September 3rd, having a large number of passengers for the various ports. She left the same day in continuance of her itinerary, when, at 8.30 p.m., she went on to the rocks about a mile from Cape Jervis Lighthouse, Captain Fowler evidently having got astray.

She had among her passengers at the time the late Duke of Manchester and the late Colonel Sir Herbert Sandford.

From first appearances she looked like a total loss, and as she was valued at £100,000, which was not covered by insurance, it would have been a severe blow. However, it was determined to try and get her off. The passengers were sent on by other vessels, and the cargo was got out and lightered to Adelaide, when, the interior being cleared, the rocks were to be seen protruding through the bottom into the holds. These projections were cut away, and she ship's bottom repaired from the inside as the tides permitted, and 3 feet of cement laid on top of it, and she was floated off on November 13th, towed to Melbourne, and docked; and after being thoroughly repaired she once more took up the running.

The *Iberia's* claim to public attention was not through disaster, but through having the honour, if such it may be considered, of being one of the two vessels which carried the first Australian troops from these shores to take their part with Great Britain's soldiers in war against her enemy.

When the British Army was engaged in the Soudan fighting against the forces of the Mahdi, Mr. Dalley, acting on behalf of the New South Wales Ministry, offered to send a battalion of infantry and a battery of artillery to assist the British forces. The offer was accepted, and the troops embarked on March 3rd, 1885, amidst much enthusiasm, on the Orient liner *Iberia* and the Aberdeen steamer *Australasian*.

In 1879 the Company commenced to have its own ships built, the *Orient* being the first. She came from the yard of John Elder & Co., an iron vessel of 5,365 tons, considered, when launched (and it is just about forty years ago), one of the wonders of the day, but sinks into insignificance when compared with the Company's latest boats. She was a great advance, however, then, and the London and provincial newspapers devoted columns to her description, and what it was destined for her to accomplish, eulogy which present great vessels did not get because they are only step by step in advance of their predecessors, but the *Orient* came with a bound. Her length was 445 feet 6 inches as against 600 feet, the length of the Company's latest vessel, the *Ormonde*.

For a long while the *Orient* was a favourite with travellers, whom she served with regularity for about thirty years, when she passed on, in 1909, to the breakers' yard for £12,000.

The next to carry the O.S.N. Co.'s flag was the *Austral*, so named, it is presumed, from the country she was to serve, as a compliment, and the only one which has not had the initial O before her name. This beautiful vessel (for it is generally conceded that her yacht-like appearance entitled her to be so described) was launched in 1881 from the yard of John Elder & Co., and made her first appearance in Sydney Harbour early in 1882. On her second voyage, Captain Murdoch

being in command, she arrived November 3rd of the same year, and after discharging her cargo was taken to the Orient buoy in Neutral Bay to coal, and when the steam collier *Woonona* was alongside, at 4 a.m. on the 11th, too much coal was put in on the side being worked, bringing the open ports below water level, and she, following the example set by Admiral Kempenfeldt's flagship, *Royal George*, in Portsmouth Harbour, in 1782, went to the bottom. Mr. Perkins, the purser, Mr. Alexander, the refrigerating engineer, and three Arab firemen were drowned.

The raising of the *Austral* was an ingenious and interesting piece of work. The sides had timber additions, till they were above the sea level, bolted on to

them, forming a coffer-dam. She was then pumped out, and gradually came up and resumed her place on the surface on February 23, 1883. After a thorough overhaul and being refitted she was sent home under command of Captain Anderson, who came out from England for that purpose. This little incident cost £50,000. The *Austral* did not immediately take up her Australian run, being sent to New York to test her fitness, of which she gave ample evidence by making the then record time. After this she returned to her old station, in which she continued until newer vessels sent her to the ship-breaker, who returned £13,250 in 1903 for a vessel which, in 1881, cost £250,000.

(To be Continued.)

CAMOUFLAGE, ADIEU!

Especially Written for "Sea, Land and Air," by CLAUDE R. BERESFORD

(All Rights Reserved.)

We came to port in a fancy dress
Of blue, and black, and grey,
From funnel lip to the water line
The paint was bright and gay.
We winked an eye when the landsmen
laughed
And spoke of Joseph's coat;
But all the same, it is thanks to that
Our ship is still afloat.

We made our course where the U-boats
swept
The far horizon's marge:
We showed a blur in their periscopes,
With thanks to camouflage.
They say we look like a sinking ship,
Or nightmare on the sea;
We'll grant them that, and a smile as well,
For still we sail the sea.

WHAT IS IT?

Messages that leap afar
At a man's behest,
Racing where God's lightnings are,
Challenging their rest.
Over land and restless sea,
Natare sped by clicking key
In the task of you and me.

SEEBEE.

Adelaide.

But U-boats now on the wave have ceased
To ply their hellish sport,
For stem to stern in a captive line
They lie in Harwich Port.
And overside from the starboard rail
Our painting stages hang;
A strident din is about the ship,
The chipping hammers clang.

The seas are safe to the merchantman,
The rolling ten-knot boat.
So deck-hands paint on her sheering hull
Her homely peace-time coat.
And as the ship at her loading berth
Takes on her garment new,
In Melbourne, Sydney, Brisbane, Perth
We sing: "Camouflage adieu."

Established 1882.

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Tailors

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M a r i n e

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A PLEA FOR THE INDIVIDUALIST

THE INCUBUS OF PSEUDO-SOCIALISM

Especially Written for "Sea, Land and Air"

By MISS KAE McDOWELL

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Mr. G. S. Beeby (New South Wales Minister for Labour), referring to his investigations in America, states that though sectional discussions on nationalisation schemes are proceeding, he found official unionism strongly adverse to bureaucratic control. This is perhaps the most essential difference between Australian and American views.

The adoption of well-paid piece work is increasing, with the idea of supplying a counterpoise to the tendency to reduce hours. Its success is due to the stability of rates. Many paysheets proved that artisans were earning from £10 to £12 a week, and some £20, especially in shipbuilding.

—*Sydney Sun.*

The fact that Australian industrialism is standing on the brink of the grave peril of stagnation is no longer a secret shared by a few. It is known to the bulk of our responsible citizens.

The trouble has been growing for a long time, and is known under the general title of "Labour Unrest," even as the Black Plague is known under the name of Influenza. Similarly, too, its essential end seems as difficult of identification, though its effects, however, are not obscure. They show themselves in a discontent that is barren of the "divine" quality of constructiveness, and in the relaxation of individual effort. The opiate hand of the great god Sloth is pressing down upon the community. That the god is styling himself by a false name only serves to increase his influence.

It is under the guise of pseudo-socialism that he has set himself to undermine our national prosperity. The trouble is already nearing an acute stage, and a bracing and healthy antidote is being called for to counteract its effects.

This world-wide pseudo-socialism is no empire builder. Australia as a nation is still wrapped in swaddling clothes. What she needs for her various infant ailments is not a pain-killer but a cure.

The effect of socialism upon industry has been proved narcotic over and over again. Pseudo-socialism is the popular apostle of the "Easiest Way," and in that doctrine it recognises its greatest strength.

Its weakness is in the fact that it ignores the natural laws which underlie social phenomena. Every human being is born with two dominant tendencies, of which the individual is stronger than the social. Obviously no system can work successfully against the natural law.

There is nothing to be said against the genuine disciple of the socialist doctrine except that "most damning of all criticisms"—his intentions are good. Lack of science on the part of a physician cannot be atoned for by good intentions.

As a social remedy the doctrine has been described as analogous to the remedy of a doctor "who merely covers his patient's rash with an ointment that drives it in, to work a more subtle injury to the vital parts, instead of removing the cause of the disease and setting free the vital force to eradicate the effect."

The salvation of industrialism lies then in the fact that ultimate victory must go to individualism—modified perhaps, because its ethics are based upon the most dominant tendency of the race.

Individualism has been, through all the ages, the spur to evolution and success. In our own land it moulded the pioneers and, nerving them against drought and fire, gave us the heritage of prosperity. The superhuman struggle of the Australian soldier at Gallipoli yielded the pure gold of Anzac heroism. True, in its extreme stages it tends to undue oppression and harshness towards the "under-dog." Extreme measures are only suited to extreme cases, and the highest ideal of civil life seems to be in tempered individualism.

In it is the bubbling fountain of success, the life of all enterprise. The nation that has followed its tenets is the most prosperous in the world to-day. That nation is America.

A Sydney business man, recently returned from thence, discourses now endlessly upon the power of individualism to open the locked door to success.

But it was not all at once that America learned her lesson. She floundered through many a crisis before the light broke and she got a glimpse of her goal. Now she is making straight towards it, however, brushing the remaining scales from her eyes as she goes.

Enterprise is "boomed." Some of its stages border on the farcical. For instance, you can buy the morning paper overnight in San Francisco. "Individual Service" is the motto of her commerce and "We'll try anything once" her slogan. If a proposed venture is worth trying there is no shuffling as to who shall first try it. The man who gets in early with a good thing is the man who succeeds. The leaven of individualism has invaded the whole "communal lump" and invaded it to some purpose.

The Australian making his first trip to the States is astonished beyond measure at his own apparent importance in the eyes of the American man in the street. He is also flattered by it.

In his own land he has been trained in the belief that a certain brusqueness gives the impression of sturdy independence, coupled with prosperity. The meed of his hospitality towards an overseas stranger has usually been, "Glad to see you. Have a cigar." "Come across the way for a drink." At most, "You must have lunch."

In the States the casual acquaintance in the cars shakes him warmly by the hand at parting, with the words "When you come to our town, look me up and I'll see you have a good time." And he means it. The American business man "boosts" his town as he "boosts" his business itself. A thriving locality makes for a thriving trade. Good feeling never did anyone any harm. So the stranger is made to bask in an atmosphere of geniality. Beneath it his native prejudice against the hustling Yankee melts. He is fêted by concerns to whose annual turnover his little quota could compare but as a drop

in the ocean. In "Little Old New York" a million dollar firm will allot him one of its staff for a whole day to show him the sights of the city.

Yes, "Individual Service" is the watchword of the successful American business man. He knows it as the most efficient advertising agency in the world. It not only advertises the firm, but the nation the firm belongs to.

The great god Sloth can have no part in such a system. All his disguises were pierced and he was cast out long ago.

It is the spirit of individual service then that is needed at the present moment to galvanise Australian commerce into something approaching real activity. Constructive effort must be stimulated by the imperative need for excellence, not lulled to a state of somnolence by the drugging creed of pseudo-socialism.

Tempered individualism involves socialism in its only practical sense, and it leads to the finest kind of co-operation. It joins the individual to the social and "establishes solidarity on the highest plane of common intelligence and joint volition."

It is a balance of individualism and socialism operating in the active situations of life that contribute to the real welfare of mankind.

At present the world is suffering from an over-dose of socialisation which is setting the two forces of industry, Capital and Labour, at each other's throat. It is hacking at the roots of the tree of progress. It is lowering the standard of work. It is relaxing the sinews of enterprise and placing the whole problem of living into a false position.

The most urgent problem of to-day in the world of Labour, is that of saving the individual qualities of men that Society may profit by them. By suppressing the free exercise of personality the group suffers a return to mediocrity in all its activities.

Another crime against the doctrine of this pseudo-socialism is the brutal murder of all initiative. Australians are credited generally with having a useful "lump" of quality, but latterly "the sunshine of its smile" has become hidden beneath the prevailing smirk of hostility and suspicion.

Grudging service never made for success.

The highest form of individualism is the struggle for excellence. It is the legitimate motive for ambition and competition. It offers scope for natural and sane advancement. As healthy rivalry in sport develops the personal powers without

damage to the welfare of others, so does rivalry in other walks of life develop invention, heroism, discovery and legislation. It also strengthens the sinews and renews the moral forces of mankind.

It is time we opened up the throttle a little and gave it a chance.

WIRELESS TELEGRAPHY

Especially Written for "Sea, Land and Air"

By MISS MYRA M. CAMPBELL.

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And to think that the secret was always there,

Locked up in the chamber of unknown things:

Till a man, with a brain beyond compare
Discovered the key, and gave it wings.

The knowledge was captured, and harnessed down,

Like a mighty slave, for the use of man:
And it grew, and it gathered wide renown,
As only a great discovery can.

Now it links great continents far and wide,

And it bears a message from race to race:

Whilst the only steed that it needs to ride
Is the ether, filling the world of space.

And the mariner no longer feels

Cut off from the vanishing shores of home:

Though the storm rack drives and his vessel reels

He can send his message o'er leagues of foam.

For the apparatus he carries to-day

Is all that he needs to convey his words,
'Neath frowning skies, o'er waters grey

They will flash like a flock of winged birds.

From England there comes to our sunny land

A message, in less than a moment's space—

It is hard for the brain to understand
The unseen flight of its aerial race.

Twelve thousand miles has it sped along:
Defeating space, and defying time:

With a rush that is mighty, swift and strong,
Traversing many a varying clime.

O'er fallen shrine and forgotten grave,
O'er graven image and desert sand,
It travels, this wondrous electric wave,
Bringing us news from the Motherland.

O'er oceans rolling in sullen might,
O'er jungles deep and forests far,
Through dim light dawning, and darkening night,
It shoots—like a wonderful shooting star.

* * * *

And to think that the secret was always there,

To think of the mysteries yet untold,
To think of the wonders in earth and air,
That TIME, the revealer, will yet unfold!

THE WIRELESS INSTITUTE OF N.S.W.

A general meeting of the members of the above Institute and of all interested in Radio-Telegraphy will be held on Friday, March 14, at Wireless House, 97 Clarence Street, Sydney.

PATENTS AND TRADE MARKS

WILLIAM J. DAVIS,
Patent Attorney,

Bull's Chambers, 14 Moore Street, Sydney.
Telephone: 10993.

THE BATTLE OF THE ROUTES

AUSTRALIA'S OVER-SEA PASSENGER TRADE PRESENTS FEATURES OF KEEN COMPETITION

By FRANCIS JOHN

Prior to the outbreak of the war in 1914 there were five routes by which Australians might travel to and from the United Kingdom, though the Panama waterway was in what might be designated the experimental stage. This, of course, does not hold good to-day, so we now have the following routes:—

- Via Colombo and Suez.
- Via North America.
- Via the Panama Canal.
- Via the Cape of Good Hope.
- Via the Trans-Siberian Railway.

Perhaps it would be wiser to eliminate the last-named, as until the internal troubles distracting Russia at present are settled, this route will not be available. When the world settles down to conditions approaching those we knew in pre-war days, if indeed it ever does, a battle of the routes may be confidently anticipated, though with what degree of intensity it is impossible to say. Before proceeding to discuss the various routes it may be advisable to consider the Australian passenger or tourist. Outside the Commonwealth he is regarded by hotel proprietors and storekeepers wherever he has been accustomed to visit as a most prolific spender, and consequently a highly desirable personage. He is even held by some to outdistance the American traveller in the freedom with which he disposes of his money. Further, it has been held that proportionate with the population Australians were the greatest travellers in the world. Let this claim be carefully examined, over a period say from 1908 to the end of 1913, and it will be found to contain a considerable amount of truth.

It will be observed then that quite reasonably enough interests which catered for the traveller over the different routes concerned desired that the various steamship companies should endeavour to secure for their particular or

individual route the maximum number of passengers possible. In, of course, varying degrees, exceedingly large amounts of capital were invested at ports and towns the Australian traveller would call at, in hotel and other ventures directly catering for his patronage. So it came about that there was a decidedly business side associated with the routes which could not be overlooked, and which created not a little of the rivalry existing between them, a rivalry under the supposition already set out which the future will see considerably aggravated.

Colombo-Suez Route.

Unquestionably the most important route from Australia to Great Britain is that *via* Colombo and Suez, and it presents certain features which are not to be found on any of the others, in possessing two of the most interesting countries in the world, Ceylon and Egypt, but two countries which are at the same time two of the leading tourist resorts. Ceylon was not always a tourist resort for Australians. Just over 18 years ago a movement was started in Colombo for the issuing of special tourist tickets between the Commonwealth and the Island-Colony. This was conducted with untiring energy, and after five years success crowned the efforts put forth. At first Mr. Trelawny, the then Superintendent of the P. & O. in Australia, did not regard the agitation with sympathy, but after was "converted." Mr. A. Gordon Wesché, the then Assistant Superintendent, and now Superintendent, ever rendered valuable assistance. Mr. F. C. Allen, at present one of the assistant managers of the line in London, and at the time P. & O. agent at Colombo, proved a tower of strength to those fighting for the concession. The late Mr. D. Anderson, General Manager of the Orient Line at Sydney, and Mr. David

Reid, his successor, gave all the help in their power. In London, Sir Thomas Sutherland was believed to be against it, whereas Sir Kenneth Anderson, of the Orient Line, was decidedly sympathetic. What caused the delay in conferring the boon requested? It is permissible now to state that the objection came from the North German Lloyd directorate. The Ceylon Planters' Association gave their influential support; the Press of the colony was unanimously in its favour, so too were the merchants and other business people. In February, 1908, the Ceylon Bureau in Australia was opened, and from the reports, which go down to a brief period before the war, the following figures are taken showing the number of Australian tourists who visited Ceylon during the years indicated:—

1908-9	256
1909-10	506
1910-11	519
1911-12	564

Thus a steady and continuous growth of what became a lucrative business covering one section of the route has to be noted. That the Ceylon Bureau will reopen is not known, but if it does there will have to be manifested a complete unity of the various interests benefiting from this influx of Australian visitors, which unfortunately did not previously exist, and the absence of which may have led to the Government not seeing its way to render the Bureau official recognition or financial assistance.

It is extremely probable that Egypt in the future will receive more Australian tourists than ever before for reasons associated with the war, many of them melancholy ones, which will be quite understood. But wherever vessels on this route touch indications will be found testifying to the heroic effort this young section of the Empire put forth. In general popularity it will be found that in the days to come, when the wheels of commerce and travel begin to revolve easily, the Suez-Colombo route will not suffer, despite any competition from other quarters.

The Cape of Good Hope Route.

Popularly known as the Cape Route, for at least a dozen years before the war the amount of passenger traffic carried

over it showed a growth little less than phenomenal. Once regarded as the least desirable route and only taken by those who could not afford to travel by way of the Suez Canal, it became a route rivalling in popularity the older one, and employing ships of much larger tonnage than had ever visited Australia before. The White Star Line did for this route much what the Midland Railway Co. did for third-class passengers in England in 1872, when the directors abolished second-class. Efforts were being made before 1914 to attract Australian tourists to the South African Union and with some considerable measure of success, and that they will in due course be resumed does not appear to admit of doubt. Whether the Cunard Line will enter serious competition for the highly lucrative traffic that is bound to occur along this route is a question it must be left for the future to decide.

The Panama Route.

There are certain indications that interesting developments may be looked for over this, what may be called, youngest route between Australia and the Motherland. Many will naturally desire to witness one of the most stupendous feats man has ever performed, knowing further how it was associated with the long-drawn-out battle against yellow and malarial fevers in Panama, and that it was only by conquering the mosquito that the glorious engineering feat—the cutting of the canal—was accomplished. Just beyond the Western entrance to the Canal lies an island of entrancing natural beauty—Jamaica. Its chief town, Kingston, situated on a glorious harbour, is to be made a free port, and shipping facilities greatly improved. It is to be the main port of call for vessels using this route between Australia and the United Kingdom. It will not be questioned that Ceylon will discover a new and serious rival in Jamaica, and when we find men like Sir Owen Phillips, M.P. (Chairman of the Royal Mail Steam Packet Co., and of the Union Castle Line) keenly interested in making this “pearl of the West Indies” a tropical resort for Australians, Britishers and Americans, surprise will not be expressed if in due course the average Australian hears more about Jamaica and its attractions than he ever heard previously. It is

interesting to recall that in September, 1913, in the new trade conditions the opening of the Panama Canal would bring about were included a number of shipping companies, and from the list the following are extracted:—

Royal Mail Steam Packet Co.—Service between Southampton and Sydney.
Blue Funnel Line (Alfred Holt & Co.).
—Round the world service.

Harburg-American Line.—Round the world service, via Australia and Suez.

Grand Trunk Pacific Railway.—Vessels to unite at Prince Rupert with Company's proposed Australia service.

Canadian Pacific Railway.—Fast passenger steamers to connect at Vancouver with Company's services to Australia and the Orient.

Compagnie Navale de l'Océanie.—From Europe to Pacific coast, thence to South Sea Islands and Australia—cargo and passengers.

It will be noticed that this newest route is rich in possibilities, and may exert influences on other routes being considered in this contribution, the extent of which it would be futile to attempt to speculate upon. Some six years ago the late Colonel Sir Henry McCallum, R.E., when Governor of Ceylon, was asked to express an opinion on the effect of the opening of the Panama Canal and established trade and passenger routes of the world. His Excellency's reply was: "Nobody can say what will happen"; and we now, if asked a similar question, might reply in precisely similar terms.

The North America Route.

To-day the North America passenger route to Europe from Australia is conducted by the Oceanic Steamship Co., the home port of which is San Francisco; and by the Union Co. of New Zealand, which maintains services to San Francisco and Vancouver. This route takes us back to what would now be regarded by some as "the hoary days of antiquity." When the Union Pacific Railway was constructed business men in the United States looked for the establishment of a line of mail and passenger steamers to link up the city of the Golden Gate and Sydney, and thus supply an alternative route from Europe to Australia in place of the expensive overland

route across the Egyptian desert and the long and unenviable route, as it was then known, *via* the Cape. The service was duly inaugurated, and the first Australian cricket team, that is the first white team to visit England, in 1876, availed themselves of it. Still the American service had a chequered career, for causes it is beyond the purview of this contribution to inquire into further than to state that the improvement in the British services and the opening of the Suez Canal unquestionably exercised an influence in bringing this state of things about. The present Oceanic Steamship Co. was inaugurated with much flourish of trumpets, but after some period of experience, which must have proved remarkably costly, the vessels comprising the fleet were laid up. Spreckels Bros. then revived the venture, but disaster seemed to face them until they secured the right man to look after their interests in Australia. When that exceedingly able and enthusiastic gentleman, Mr. V. A. Sproul, was placed in charge, the old order at once changed, the business at once became profitable and the speediest route from Sydney to London, *viz.*, 29 days, was offered. But Mr. Sproul looked to a wider horizon than that merely associated with his ships. He saw that Australians and Americans had much in common, but unfortunately their knowledge of each other was limited. To improve this was the object, and in a remarkably short time Mr. Sproul had devised and carried into execution a publicity campaign the objectives of which were twofold; first to induce as many Australians going to Europe to travel by his line, "the Short Route to London," and second to arrange that while in the United States they saw as much of the country as possible. The effects of this campaign has barely become noticeable when "the war drum rolled around the world." At once the mail steamers of the Oceanic Steamship Co. occupied a position of supreme national import, and supplied the chief mail channel between the Commonwealth and the United Kingdom. In the delicate and often intricate work carried out in and from Australia while the United States was a neutral Power, the General Manager of the line again gave evidence many times and oft of ability, tact and scrupulous probity. Since the United

States became a combatant the work performed by the Oceanic Steamship Co. on the Pacific route is too well known to need further reference. When the new express steamers the company it is announced contemplate constructing are ready for commission, "the Short Route to London" will enjoy an added popularity. The Union Company's San Francisco service has furnished an indication of the growth of traffic over this route.

When we come to that section of the North America Route embraced in the phrase "Sydney-Vancouver" we find a splendidly appointed service a credit of the highest kind to the great company which conducts it. An accretion to its popularity was due to the placing of the R.M.S. *Niagara* on the service, the finest and most elegantly appointed ship ever seen south on the line. But this route has had its trials; everything has not been exactly plain sailing, still it is a monument to the enthusiasm of an Australian, the late Mr. Frank Huddart, who went to London in the early 'nineties to secure support for the line of fast mail steamers he desired to see established between Sydney and Vancouver. His Imperialism was not questioned, but his belief in the commercial success of the scheme he had at heart did not convince the City. However, a measure of support was forthcoming, and it was soon after his visit that the line was inaugurated. For years it struggled with difficulties. To-day a brilliant success, it is constituted a memorial to one of the most unselfish Australians who ever lived, a man who loved his land and his Empire, and in the practical, though in a sense pioneering, work of establishing "The All-Red Route" he has left a monument as enduring as that of brass or granite.

Associated with the North America route is, of course, the proposal put forward to connect Prince Rupert, the mag-

nificent Pacific port of the Grand Trunk Pacific Railway, some hundreds of miles nearer Sydney than Vancouver, with Australia's shipping metropolis by fast mail steamers. However, the war has made the position to-day somewhat obscure, and it is not possible to say anything definite save that some time or another such ships will be running and provide added strength to the North America flank in the battle of the routes. It must not be thought that all the forces capable of being mustered for strengthening this route have as yet been called up. The vigorous ports of Seattle and Portland are demanding that their quota shall not long be denied. Looked at from every aspect it appears that the potentialities are great on the side of this route in any future struggle.

Via Siberia.

It passeth the understanding of man to say when or how Russia will emerge from the catastrophic condition in which she is now plunged, and just so long as the clouds are dark and lowering so long will this condition remain. When better days arrive the trans-Siberian route will never be a strong competing factor in the contest for Australian passenger traffic to England. The completion of the North-South railway may have some effect, but the trip through the China seas, by rail through Korea to Mukden, imposes a big sacrifice of time, though Mukden to London in ten days is not an impracticable or visionary proposal.

The whole question of this future battle of the routes is one of much interest, and in the brief and consequently imperfect and disjointed manner it has here been considered may create a desire on the part of many to go into the matter in detail, and if that is done their labour will not have been in vain and their interest in the theme conserved to the end.

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THE HON. WILLIAM WEBSTER AND THE AUSTRALIAN AERO CLUB

INTERESTING CORRESPONDENCE

Some interesting correspondence on the subject of aviation has passed between the Hon. William Webster, Postmaster-General of the Commonwealth, and Mr. H. J. Sleeman, Hon. Secretary of the Australian Aero Club. By the courtesy of Mr. Sleeman we are enabled to publish copies of the actual letters. We do so without comment; in our opinion none is necessary.

(1)

Australian Aero Club,
91 Elizabeth Street,
Melbourne, 20th Dec., 1918.

Hon. W. Webster,
Postmaster-General,
G.P.O., Melbourne.

Dear Sir,—

The Australian Aero Club was formed in Australia in 1915 to promote and control Aeronautics within the Commonwealth.

The Club is affiliated with the Royal Aero Club of the United Kingdom, the aeronautical authority recognised by the Imperial Government, and with the Federation Aeronautique Internationale of France, the recognised international authority.

Since 1915 the Australian Aero Club has issued, under authority from the Royal Aero Club and the Department of Defence, Commonwealth Government, Aviators' Certificates in Australia, but owing to the absence of the majority of the members on active service overseas, it has not been possible for the Club to carry on any other work.

It is now proposed, however, that the Club should carry out the same work within the Commonwealth that the Royal Aero Club has for years carried on within the United Kingdom, and to generally follow a progressive policy regarding the promotion and control of Aeronautics.

Application Form for membership is enclosed, and if you desire to become a member of the Club will you kindly fill in the attached form and return it to the

Secretary, together with subscription for one guinea.

Yours faithfully,

(Sgd.) H. SLEEMAN,
Hon. Sec. Australian Aero Club.

(2)

Mr. Webster Replies.

Commonwealth of Australia,
Postmaster-General,
Sydney, 30th December, 1918.

The Hon. Secretary,
Australian Aero Club,
91 Elizabeth Street, Melbourne.

Dear Sir,—

I duly received yours of the 20th instant relative to the Australian Aero Club, form of application for membership of which you enclosed. I gather from your remarks that the club will concern itself with activities in other lands, and I regret my busy life does not admit of research to discover what they are.

Yours faithfully,

(Sgd.) WILLIAM WEBSTER.

(3)

Australian Aero Club,
91 Elizabeth Street, Melbourne.
7th Feb., 1919.

Hon. W. Webster, Postmaster-General,
G.P.O., Melbourne.

Dear Sir,—

I am in receipt of your letter of the 30th December, in reply to mine of the 20th.

I very much regret my inability to make the objects of the Australian Aero Club any plainer to you, and it seems strange that out of some two hundred persons cir-

cularised, you—the Postmaster-General of the Commonwealth—are the only one unable to grasp the fact that the objects of the Australian Aero Club are to promote aviation for commercial, sporting and pleasure purposes in the Commonwealth, and it is the intention of the Club to see that such a condition of affairs is brought about.

Yours faithfully,
 H. SLEEMAN, Hon. Sec.,
 Australian Aero Club.

(4)

Commonwealth of Australia.
 Postmaster-General
 Melbourne, February 12, 1919.

The Hon. Secretary,
 Australian Aero Club,
 91 Elizabeth Street,
 Melbourne.

Dear Sir,—I am in receipt of your letter of the 7th instant, with regard to my reply to your previous notification as to the formation and objects of the Australian Aero Club.

I note what you now have to say on the subject, and appreciate the compliment unwittingly paid me. I never profess to grasp matters until I feel that I fully realise what they involve, and mine is an honest anxiety not to link myself up with projects until satisfied that I would be justified in so doing.

Yours, faithfully,
 (Signed) WILLIAM WEBSTER.

AUSTRALIAN AERO CLUB.

A committee meeting of the Australian Aero Club was held at the Club Rooms, 91 Elizabeth Street, Melbourne, at 8 p.m. on Friday, February 7, the following business being transacted:—

Elections.

Fourteen (14) new members of the Club were elected.

Flight to Australia.

The Secretary of the Club was instructed to write to the Royal Aero Club and inform them that the Australian Aero Club will extend every assistance to the pilot of the first machine to fly from England to Australia.

A CORRECTION

The Editor, *Sea, Land and Air*,

Dear Sir,—

With reference to the reproduction of the Straight Transverse Frame, which appeared in your February edition, I beg to inform you that the general arrangement of the ship being a reduction from the 16-inch scale plan sent you, the scale should not have appeared on the reproduction on page 699.

With regard to the mid-ship section on page 701 the scale should not have appeared there either, as the reproduction is also a reduction from the plan sent which was on the scale of $\frac{1}{2}$ -inch to the foot.

I shall be glad if you can kindly insert a correcting note in your next issue.

Yours faithfully,

H. W. CURCHIN,
 Chief Executive Officer,
 Commonwealth Ship Construction.

[The above letter is, we believe, self-explanatory, and as the original plans referred to have now been returned to Mr. Curchin, we can but express regret at our omission.—Ed.]

OUR QUESTION BOX

- T. R. Everingham, Penrith.—Apply Major Sheldon, O.C., Central Flying School, Laverton. "Pioneer," Melbourne.—Thanks for suggestion. See current issue.
- F.W.G., Lakemba.—The "Chusan" reached Hobson's Bay, July 28; Port Jackson, August 3, 1852.
- P. L. Morphett, Casterton.—The Australian Aero Club, 91 Elizabeth Street, Melbourne. No other organisation in the Commonwealth is empowered to hold examinations of pilots or to issue certificates.
- "Curious," Prahran.—Like yourself, he prefers to remain anonymous. Address your letter "Prop. Boss," care of this Journal, for re-direction.
- "Sparks," Newcastle.—Explain your difficulty to The Wireless Press, 99 Clarence Street, Sydney; their catalogue probably contains what you seek.
- F. C. Guthrie, Pymble.—(1) See *Sea Land and Air*, August, 1918. (2) Referred to our Melbourne correspondent. (3) Approximately £3 15s.

WIRELESS PUBLICATIONS

From The Wireless Press, 99 Clarence Street, Sydney, comes a new book on Radio-Telephony (250 pp., cloth 8vo., 12s.), by Alfred N. Goldsmith, Ph.D., who, besides holding a Fellowship of the Institute of Radio-Engineers, is a Member of the Institute of Electrical Engineers, a Director of the Radio-Telephonic Laboratory and Professor at the College of the City of New York.

The volume is exceptionally well produced and, with its 226 photographs and diagrams, will be welcomed as a complete text-book not only by wireless men in the Navy and Mercantile Marine but by all interested in aviation.

From the same Press we have received also a copy of "Practical Wireless Telegraphy" (336 pp., cloth, 8vo., 9s.) by Elmer E. Bucher, Member of the Institute of Radio-Engineers and Director of Instruction at the Marconi Wireless Telegraph Company of America.

In selecting the types of apparatus to be described the author has chosen those most widely in commercial use, giving the non-technical reader a sound working knowledge of each. Contrary to the practice adopted in most technical publications, Bucher's book begins with a general description of the fundamentals of electricity, electro-magnetic induction, the dynamo, motor, generator, storage batteries and charging panels, a knowledge of which is no less important to the practical wireless worker than are the more complex phenomena of radio-frequency circuits.

Starting with elementary data, it traverses, chapter by chapter, the entire field of wireless, explaining each subject separately and furnishing a complete progressive study, from first principles to expert practice.

The revised edition contains 342 excellent illustrations and should be read by every young student seeking a thorough practical grasp of the subject.

We are requested to announce that the Wireless Press catalogue of new publications will be forwarded post free to all readers of this journal.

WIRELESS BY GRAMOPHONE.

Of the many forms of wireless tuition few will appeal more strongly to the home student than the "Gramophone Method," particularly to the amateur wishing to attain speed and accuracy in "receiving." For this purpose his sole requirements are an ordinary gramophone and a set of the Marconi official gramophone records of wireless signals. Thus equipped and comfortably installed at home in his favourite chair, the student selects a record, adjusts the speed indicator, turns a handle, and at once begins to receive messages under conditions similar to those experienced by the operator at sea. By regulating his instrument he may reduce the speed of a message which may be coming through faster than he can read, or increase it if the reverse be the case.

Fuller particulars of the wireless records will be found on page 763.



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THE "ARAFURA SPECTRE"

A TALE OF THE COMMONWEALTH AERIAL CUSTOMS PATROL OF 1922, AS CHRONICLED BY AN AERIAL HISTORIAN, A.D. 1922

Especially Written for "Sea, Land and Air," by C. A. JEFFRIES
(All Rights Reserved.)

During the Great War, which terminated so unexpectedly in 1918, most people believed that immediately hostilities ceased all restrictions on civil and commercial aviation would be removed by the governments concerned. But it was not so. All over the world the governments seemed reluctant to part with the actual control of the production and distribution of aero engines and planes or parts of planes.

Hardly had the dust settled on the battlefields of Belgium than the British Air Ministry set to work to create an aerial police service composed of aerostats of the rigid, or Zeppelin type, and very fast, well armed aeroplanes for distribution along all the branches of the All-Red Imperial Aerial Mail Routes. At the same time the Government approached the whole of the Allied Governments with a view to formulating an international code of laws governing aerial navigation.

This governmental disinclination to part with absolute and detailed control of aviation was dictated by a very proper prudence. The unrestricted output of aeroplanes would have placed tremendous opportunities for lawlessness in the hands of unscrupulous and daring men. Europe was littered with cast-off armament. Entire divisions of German troops had sold the whole of their equipment, including machine guns, artillery and, in some cases, aeroplanes. Bayonets, automatic pistols and revolvers could be bought two for a shilling. It was firmly believed that there were large numbers of men who only awaited the opportunity to become aerial pirates and get rich quickly by raiding defenceless communities and holding them to ransom under pain of being bombed from above.

Not till far on in 1919 was private enterprise allowed to operate anything but short distance planes. Air ships capable of flying overseas, or carrying more than two or three people, were strictly forbidden, except by the express permission of and arrangement with the Air Ministry. All manufacturers of aero engines had to number them in rotation, and keep a record of the names and addresses of the purchasers. All owners of aeroplanes or aero engines were compelled by law to register, and to notify sales within twenty-four hours of the transaction.

The first real development after the cessation of hostilities was the creation by the British Government of the All-Red Imperial Aerial Mail Service, by which mails and passengers were carried in huge Handley-Page planes to all parts of the Empire and to the aerial ports of entry in foreign countries. This took place in 1919. Not till towards the end of 1920 was Private Enterprise given the freedom of the skies.

By 1922 commercial aviation was thoroughly established, vast improvements were made in the planes, which made aerial travelling the safest ever, as well as the swiftest. The British Empire was thoroughly consolidated and London and Sydney were closer to each other in time and cost than Sydney and Perth had been before the Great War. The increased intercourse between the various races made it imperative that some language should be adopted as the universal tongue, and the English, with its 650,000 words, seemed the ideal one. It had become a wonderful world, and idealists saw in this tendency to adopt a common tongue and this wonderful mingling of the peoples, the promise of an early federation of the whole of the white races.

The lessons of the Great War were taken to heart by the white peoples. The world's supply of semi and wholly automatic machinery had been increased enormously, with the result that the production of manufactured goods was on a scale hitherto unknown in all history. Then followed an enhanced standard of living in all European countries, barring the remnants of the Central Powers, where they paid the penalty of their enthusiastic support of the Hohenzollern bid for world domination by a long series of years at low wages.

In 1922 the world was startled by a terrific outbreak of aerial smuggling. The reason was not far to seek. To foster the internal production of wealth the various governments had all imposed tariffs that ranged from 150 to 175 per cent. *ad valorem*, where they did not actually control importations of foreign goods by direct regulation. As all white countries had become self-supporting and practically self-contained, any goods that could be dumped into foreign markets were practically all profit to the people who did it. For decades the manufacturers of the world had been encouraged to dump goods, and now when surplus products represented all profit, smuggling became a lucrative business as well as an exciting pastime.

Australia, owing to the conglomeration of islands to the north of the continent, was peculiarly susceptible to this sort of commercial raiding. There were literally thousands of islands within easy flight of the Australian coast, where contraband could be hidden in enormous quantities till opportunity offered to rush it through the Customs cordon. Many of these islands were uninhabited, others were in the sole possession of aborigines, and in any case Australian Revenue aeroplanes could not inspect or search islands belonging to Foreign Powers.

This state of affairs led to the establishment of the now-famous Aerial Customs Patrol, that wonderful service which took the place in romance previously occupied by the Canadian North-West Police and the Chinese Imperial Customs. The new Romance called with a threefold siren song—the song of sea and land and air.

Established in a chain of aerodromes extending from Broome in West Australia right round the shores of the Timor, Arafura and Coral seas, to within sight of Brisbane in Queensland, the pilots and officers of the Patrol lived a life which, for excitement, freedom and beauty of environment, was unequalled anywhere. To these men the wondrous submarine gardens of the shallow, tropical seas were an open domain. They lived in an enchanted world of wonderful and ever changing colours. Seas changed from green to blue, and blue to purple. Shores were golden or silvern, according to whether the beaches were of sand or shingle. Land changed from green to yellow, yellow to violet, blue and purple. Seen from the sky the world was always beautiful, always picturesque, even when it was terrible, even as the sky is when seen from the earth. These lucky men called themselves "the Angels of the North," on account of the heavenly time they had. So attractive was the service that the flower of the youth of the Empire was always found round its enrolling offices.

Australia in 1922 had only two ports of aerial entry; one at Darwin for the planes from Europe, Africa and Asia; the other at Port Stephens in New South Wales for those from the Islands and New Zealand. To these two ports flew all law-abiding aeroplanes from overseas, while the others appointed their own ports of entry, and to locate them was the work and delight of the Aerial Customs Patrol.

All of which leads up to the legend of "The Arafura Spectre."

* * * *

The Sydney-London Imperial Mail had been detained four hours for the convenience of a most exalted personage, consequently, at 3.15 a.m. on the morning of February 4, 1922, was that number of hours out of her usual position. The great liner, a blaze of light, was rushing through the sky at a speed of nearly three miles per minute. The passengers were all fast asleep and the commander was resting in his cabin, when the passengers felt a fearful lurch and were hurled violently from their berths. With a bound

“The City of Sydney—A.D. 1971”

The North Shore Tunnel is built;
 The Circular Quay filled in, and now a
 public pleasure park;
 The Sydney Observatory a central aero-
 drome;
 New forms of travel, new thoroughfares,
 new styles of architecture;
 New coinage and currency;
 Bank notes as small as visiting cards;
 New styles of dress;
 New social customs, new laws and Acts;
 Wireless newspapers; wireless telephones;
 A six-hour day;
 The Metric System adopted.

¶ These are but a few of the wonderful changes
 seen by Mr. Alfred Chatterton, a Sydney
 engineer.

¶ Falling, in June, 1918, into a prolonged cata-
 leptic sleep, he awoke in 1971, after 53 years
 and 204 days, to resume his normal activities.

¶ Mr. Chatterton's experiences form one of
 the most amusing and instructive stories ever
 penned.

The title of his story is

“The City of Sydney—A.D. 1971”

and the first instalment of it will appear

In the April Issue of “Sea, Land and Air”

Commander Iveson reached the steering dome.

"What on earth's wrong, Mr. Martin. What *are* you doing?"

"Dodging an unlighted cargo plane right in front. He carries no lights; missed him by feet, curse him."

The commander stared through the ports, and then took the wheel:—

"Send out a wireless, Mr. Martin; that plane must be arrested."

"He's a smuggler—that's what the swine is. Still, he could not help seeing us, as we're a blaze of light."

Then the wireless man began to talk, and within five minutes there were at least half a dozen planes soaring in different quarters, and that mysterious plane was the centre of a circle of aerial guardians—a circle that was momentarily narrowing. But none of them saw anything, and the Press later on explained that it was scientifically impossible for that plane to have escaped, and it was, therefore, obvious that Mr. Pilot Martin had been misled by some curious cloud formation. Whereat Mr. Pilot Martin was virtuously indignant.

* * * *

Mr. Hop War, a vegetable pastoralist and vendor at Normanton, Queensland, arose at his usual hour and harnessed his trusty Dobbin. He was just about to enter Normanton when he heard a curious sound which seemed to come from the sky. It was a clatter that rapidly swelled to a perfect roar. The sleek and ancient Dobbin became seriously alarmed and astonished Hop War by breaking into a shambling gallop. There was no use trying to get away from this thing, whatever it was, so with a desperate effort Mr. Hop War succeeded in reining Dobbin to a standstill. The noise was directly overhead, and the Chinese distinctly felt a great gale. With a cry of terror he looked up and saw a gigantic shadow streak overhead, and blur away into the distance. As it faded the cyclone of sound droned and died away. The last he saw of it it soared up to clear some trees that were right in its path, and Mr. Hop War realised that at last he had seen one of the mysterious sky ships that killed people in their sleep. He attributed his

own continued existence to the fact that he had escaped notice.

Just then there appeared on the scene Constable Riordan, and upon him fell Mr. Hop War, telling of the apparition, and the policeman listened eagerly, and proved to his own pleasure that he had not been seeing visions and dreaming of fierce noises. Then Hop War stopped talking, for his ear had caught that distant clatter once more, and he knew the sky ship was coming back to kill. But the constable pointed to the south from whence came a long spear of light that stabbed here, there, and everywhere, and seemed to search the recesses of the great bank of clouds that overhung the Gulf of Carpentaria.

To the constable it was all plain. The "Arafura Spectre" had escaped detection by the simple but highly dangerous expedient of flying very low, practically skimming the surface of the earth without lights on the outward trip. While his pursuers searched the clouds he hugged the earth.

The great light from the south rushed towards them at an awful speed, and as it approached the noise increased. The plane itself was invisible, but to the constable and the Chinaman standing there agape, their eyes glued upon it, it was a ball of light from which flashed forth at intervals a long spear of dazzling light that stabbed east, north and west.

"Be hivins, they're hot-foot on the trail iv him, an' he's flyin' some, that fellow!"

* * * *

Two steamers passing in the Arafura Sea were exchanging signals, when from the lowering clouds above them came the roar of guns, mingled with a deafening clatter, that told in rattling tones that a flock of aeroplanes were racing at top speed and all unruffled. Suddenly the clouds above them seemed to open, and a great torrent of sunlight streamed down over the green water, making a gorgeous picture. While they looked into that rift of the clouds over the opalescent ridge soared a great silver-tinted aeroplane, and then, in close pursuit, firing as they flew, two much smaller planes. But it was only a momentary glimpse. All in a second the

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- 2.—Difficult letters (c, q, y, etc.) sent slowly, and a phrase containing every letter of the alphabet.
- 3.—"Simple Press" at 10 words per minute.
- 4.—"Simple Press" at 15 words per minute.
- 5.—Simple wireless messages.
- 6.—Simple wireless messages (faster).
- 7.—More difficult messages, with figures, fractions, etc.
- 8.—Code and cipher words and figures.
- 9.—Assorted messages sent at commercial rate.
- 10.—Fast messages in foreign languages.
- 11.—A long Press message "jammed" by another similar message. This and the next record afford excellent practice in reading through interferences.
- 12.—Fast messages "jammed" by a Press message.

SERIES 2.

- 1.—Identical with the first record in Series 1, except that the signals given are those of the telegraph "Sounder" on land stations in connection with the land lines.
- 2.—"Sounder" signals of Press sent slowly.
- 3.—French Press at commercial speed.
- 4.—Italian Press at commercial speed.
- 5.—Spanish Press at commercial speed.
- 6.—Portuguese Press at commercial speed.
- 7.—Figures and fractions at commercial speed.
- 8.—Press message, with accompanying noises from the ship's bell, whistles, conversation of passengers and deck-hands, etc., for the purpose of affording practice in reading wireless signals through such interruptions. This is a somewhat humorous, but nevertheless highly useful record.
- 9.—In this record two ships are heard working together, when a third in the distance cuts in with the "S.O.S." signal. The traffic of the ship in distress is then expeditiously handled, positions are given, and messages sent to say the first two ships are speeding to the rescue.
- 10.—This record illustrates the correct method of calling up a coast station, and reproduces an interchange of traffic between a ship and a shore station.
- 11-12.—Message, French and jamming.

Further courses will be issued from time to time.

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THE WIRELESS PRESS, 97-99 CLARENCE STREET, SYDNEY.

running fight had swept across the well of blue, and vanished in the direction of Dutch New Guinea. That evening they read wireless descriptions of how the Patrol had pursued the smuggler as far as the Dutch territorial waters, where the chase had to be abandoned. The "Arafura Spectre" was described as a large aeroplane of the usual cargo-carrying type, but of much higher speed: a fact that indicated the craft had been built specially for the work it was doing. The Patrol had also discovered that it was not only well armed, but also powerfully armoured, and though direct hits had been registered, no apparent damage was done. The smuggler had not returned the fire, although several guns were discharged in an opposite direction, either as a signal to confederates or for the purpose of intimating to the Patrol that a stern fight could be put up if necessary.

The Australian Press opined that after such a narrow escape the smuggler would go into retirement for a while. But these opinions were short-lived, for a week later an overseer reported that while flying round the station in a single-seater he had been passed by a huge aluminium-tinted cargo carrier, flying northward at about 100 miles per hour.

* * * *

For some unknown reason the Macdonnell Ranges had always held a fascination for Charles Blundell, and for years he had dreamed of visiting them. When the aeroplane changed the conditions of the world, Mr. Blundell saw a chance of gratifying that long-deferred hope. He bought a machine, a five-passenger one, filled the extra space with equipment, and started off to find his way to the goal of his desire one morning in September, 1922. How he would effect a landing he had not the slightest idea, and when he did arrive at the mountains he travelled for hours without seeing any signs of a place where he had the remotest chance of making a landing. The sun was sloping downward over the Great Victoria Desert, and unless he was to fly all night it became very necessary to discover a level area and take a risk. He had grave doubts of his ability to fly all night, and he began to perspire. Looking down on

the green and purple solitudes, peering right and left for a sign of a plain or a tableland, he was amazed to see a huge aeroplane resting on a beautiful green sward at the foot of a great sandstone cliff. He circled round, and after inspecting it carefully, made a perfect landing about 40 yards from the stationary plane, which, however, showed no signs of life. He walked to it, and next moment found himself looking down the length of an automatic pistol. He was the centre of a group of very youthful men, the veteran of whom was about twenty-five years of age.

"Beastly sorry, you know; but can't help it. By the way, what's your particular occupation?" said the clean-shaven veteran.

Blundell gaped, and then held up his hands while another of the party searched him for weapons. All his personal armament was in his plane. He was helpless.

"You forgot to answer my query, sir—what is your occupation when you are at home?"

"Accountant! I say, this doesn't happen to be the 'Arafura Spectre,' does it?"

"Unfortunately for yourself you've guessed right the very first time. By the way, do you happen to be married? Better tell the truth, as your statements will be checked, and we have no desire to be harsh. It would be interesting to know what an accountant is doing in a place like this in an aeroplane."

Blundell began to explain, but the other cut him short. "Better tell me over a whisky and soda in a comfortable chair. Come inside." And he led the way up the gangway to the entrance to the aeroplane, and in a few steps Charles Blundell found himself in a dim, rich saloon, decorated in Bartolozzi red, and evidently the home of people of refinement. As they entered, a tall young lady arose from a handsome desk and looked inquiringly at them.

"Gentleman from Melbourne, just made a perfect landing on our lawn. Says he is an accountant who has wanted for years to explore these Ranges. Beastly unfortunate."

"Your wife, I presume?" said Mr. Blundell, assuming a nonchalance he was far from feeling.

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ment and all important Coal Mines.**

"Not at all," said the affable captor, "the lady you see before you is the 'Arafura Spectre.'" The lady resumed her seat and chewed the handle of her paper knife.

"I am charmed to meet you—but must really ask for an explanation of this, er—outrage. If you wish it I will pledge myself to secrecy. I have no interest in assisting to shorten your career."

The lady took not the slightest notice of his remarks, but sat with brooding brows staring at her desk. Then she glanced at the young man and said quietly:—

"Northward to-night!"

Then Blundell was escorted to another and smaller cabin, where his captor removed the handcuffs, and requested him to serve the drinks. When the glasses were charged the stranger leaned back and said quietly:—

"You need have no fears for your safety, but as regards your freedom I am sceptical. You see you have blundered on to a most important secret, and I am afraid that for your own safety we must keep you in seclusion for a little while. Beastly sorry, you know."

"Well, providing I am not kept in secret penal servitude too long it is worth while, if only to have met such interesting people. There's no 'dungeon cell' on board this plane, is there?"

"Oh, no, you'll have an opportunity of seeing some very fine scenery. You'll be under restraint, of course, but as pleasant as we can make it. Now I have work to attend to, so I'll take the liberty of locking you in here. Help yourself to refreshment."

At the end of two hours of observation through the port Blundell came to the conclusion that he was a fool to be there, as there was practically no difference between the Macdonnells and any other collection of Australian hills. 'Twas only distance that lent enchantment to the Macdonnells. When the last hill top had turned gray and faded out he was delighted to see the electric lights tremble into a refulgent glow, and picking up a scrap book found himself suddenly absorbed in the various newspaper clippings re the mysterious smuggler, the identical plane he was now a prisoner on.

Then his affable gaoler returned, suggested a sherry and bitters and a sluice before dinner. Dinner was in the saloon of Bartolozzi red, and there Blundell met most of the crew, including the chief pilot, the engineer, and his captor, Mr. Morris. The lady, Miss Morgan was, he discovered, the originator of the whole scheme, and the grain of it. Like everyone else on that plane she was quite youthful, not more than twenty-three.

Of that wild rush northwards, just skimming the surface of the earth, and rushing at headlong speed without lights, Blundell's recollection will ever be clear. The fearful risk so lightly undertaken froze his marrow. But he developed a great admiration for the courage of these people, lawless though they might be. He discovered that they had another aerodrome on a vast plateau among some gigantic mountains in Dutch New Guinea.

Surrounded by majestic mountains wrapped in everlasting snow, it was hard to believe they were so close to the equator. All wore heavy furs, and at nights snuggled over the radiators in the beautiful red saloon. They no longer locked Blundell up at nights, but treated him as one of themselves. He found that Australia was not the only scene of their exploits, and that at least six great planes deposited goods at the aerodrome fastness, which they had named Olympus; but only the *Aerolite*, under the supreme command of Miss Morgan, broke the Customs cordons with the contraband on board.

To Blundell, a well read and kindly man, there was something inexpressibly sad in the thought that it was only a question of quite a little time 'ere all that brave young band would be either dead or in prison. He had made up their accounts for them and had proved that they were all independent, all beyond the possibility of want, all in the happy position of being able to wander round the world, and see the wonder of it in comfort. Therefore why risk life and liberty, that was sweeter than life—especially such liberty as they enjoyed, in this crazy business of accumulating wealth they had no use for.

They listened to him thoughtfully, and took his remarks in the kindly spirit they

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were given with. Only Eudocia Morgan argued back:

"They can never get us;" she laughed: "We can outpace them all, and if we are intercepted we have guns that can smash anything that flies."

"Yes, for a time. But they are improving their planes every day, and the *Aerolite*, superb as it is, is wearing out every day. Always remember that fact."

"You can rely upon it we will never be taken alive," she replied with a little shiver. "I could never endure prison after this." Then after a pause: "Do you think they'd really put us in prison, Mr. Blundell?"

"Nothing is more certain. It is the law."

She shivered, drew her fur closer around her, and asked him to turn on the radiators.

Two days later she sent Mr. Morris to tell him she wished to see him in the saloon. Arrived there he found her alone. She seemed depressed, and there was a strained look in her gray eyes. She passed her hand through her brown curls and then looked at him with a most sombre expression.

"What's the matter—you look gloomy?" he said cheerfully.

"Mr. Blundell, we start for Australia to-morrow morning, and I want you to stay here. I have a premonition, and I have no right to jeopardise your life and character. If we do not return you can leave by the next plane that comes from Europe. Will you oblige me by staying?"

"Not if I can help it. It's only a question of time till there is a smash, and when it happens I want to be there to do what I can to look after you."

"Thank you, Mr. Blundell," she replied with a sad smile. "Do as you wish, but I would prefer you to stay. If the worst comes to the worst I can perish with the *Aerolite*. In fact, I mean to."

"Well, I'll perish with you — and that's the end of it," he said decisively.

"So!" she replied, and suddenly left the saloon.

Thirty hours later, with engines muffled to absolute silence, they soared over the mouth of the Roper River, slowed down and listened for wireless signals, and watched for those stabbing searchlights. But the sky was empty and silent and climbing to five thousand feet, the *Aerolite* flew south at headlong speed.

Suddenly, out of the darkness, a great shaft of light fell right on them, blinding Captain Blue who was at the wheel. Above the noise of the exhaust came the roar of a gun—a heavy gun—and a shell burst right in front. At the same moment the wireless spoke. Out of the sky came the words: "Surrender or I'll smash you"

The *Aerolite's* nose curved downward as though obeying the summons, and Blue, now recovered, turned his searchlight on to the ground, and then, as the aeroplane turned, the searchlight turned in the opposite direction. Then it was suddenly shut off, and the *Aerolite* shot, like a bullet, northwards. The other plane, now a blaze of light, went on, discovered the ruse, and turned like a flash.

"Look out for the Imperial Mail," said Eudocia Morgan as the engineer turned on every fraction of power. But it was useless, that searchlight stabbed and stabbed, and lit them up every time. The pursuer could not be shaken off. In two hours it would be daylight, and then the *Aerolite* must fight or surrender, or be shot down. Meanwhile the pursuer was content to just hold them.

Eudocia Morgan went to the Red Saloon, and Blundell followed her. He found her awaiting him, and as he entered she closed the door:

"It's the end—you were a true prophet."

He nodded, for just then he did not dare to try to speak.

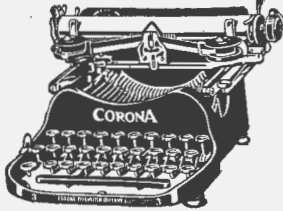
"As soon as daylight comes they will attack, so I suppose we must try and get in our fire first. It's our only chance."

"That will be murder if it succeeds, and attempted murder if it fails. Better surrender with clean hands, Eudocia."

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"And go to prison? Never: I'll die first"

"Then I'll die with you"

"Do you love me then?"

"Too much to live without you. If——"

Morris entered, carrying a curious looking parcel: "Excuse me—time presses. Miss Morgan, you're going overboard, and you, too, Mr. Blundell, by parachute, and the rest of us will fight to a finish. It's the only way."

The girl went white and then flushed crimson, drew back and placed the table between herself and Morris and drew an automatic pistol.

"This is sheer mutiny, Morris!"

"For God's sake don't waste the precious moments; that fellow has us out-gunned, out-powered—everything. He's walking right past us now to head us off where he wants us—look!"

As he spoke he drew back the curtain from the port, and there, sure enough, was the other plane, passing them two thousand yards away—passing them steadily, remorselessly with all the disdain of established superiority.

"You can take your choice, Eudocia. Either you take to the parachute or we wireless him we have a woman and a prisoner on board and so cannot fight, and must descend."

She shook her head.

Morris turned to Blundell:

"Mr. Blundell, no one will associate her with the enterprise. You can prove your *bona fides*. Will you take her over the side in parachutes, and we'll make your getaway. We are within 20 miles of Normanton. If ——"

His speech was cut short by a rending and a tearing. Morris pitched forward and fell across the polished table, then slid to the floor. It was a shot from the other aeroplane, and looking out of the port Blundell saw distinctly in the morning light the colours of the Aerial Patrol. The forward gun of the *Aerolite* barked twice, and the Patrol plane rolled from the impact of the double hit, but as it did so the nose came round half a point and the big gun spoke again. The *Aerolite* rocked and shook like a leaf in a gale, and Blundell seized the girl,

"Come quickly—we're shot down. Where are the parachutes?"

He groped on the floor and found the parcel Morris had brought in. "We'll take him, too, if he's still living. He loved you, too."

"He was my brother," she said simply. "But he is quite dead. Open the parachutes, quickly."

Quickly, but calmly, she fastened one under his arms and then adjusted her own, seized him by the hand and rushed to the door out on to the railed promenade:

"Jump first and give me courage, my lover!" she called in his ear as a sudden silence seemed to smite them. He hesitated and looked around. The Patrol plane was gyrating as though unmanageable, but fired again. The *Aerolite* gave a tremendous lurch and seemed to literally fall from beneath him. At the same moment he felt a push, and though he grasped at the rail he missed it, and was falling through space. Falling and spinning, and then the mad descent stopped and he swayed from side to side and looking up saw the beautiful *Aerolite* flying on her side. He spun round and lost sight for a moment and when he saw her again the *Aerolite* had righted, but the Patrol plane was running in great circles descending.

Then he came to earth, easily, gently, scrambled to his feet and looked for the *Aerolite*. She was a mere speck in the distance. The Patrol plane came to earth half a mile away, and he started to run towards it. He found the commander was a personal friend.

"They can't escape," said the Commander of the *Bronzewing*. There are two more like this one waiting for them. Gosh! But they can shoot. Pity to see such talent wasted."

* * * *

In ten minutes the steering gear was repaired and the *Bronzewing* went once more in pursuit. They found the *Aerolite* twenty miles further on, smashed to pieces against a great cliff of red sandstone, and in the wreck of the beautiful saloon of Bartolozzi red the mortal remains of the lovely, gifted girl, who had once been the "Arafura Spectre."