WIRELESS INSTITUTE OF AUSTRALIA

NEW SOUTH WALES DIVISION

The Fifty-third General Meeting of the New South Wales Division of the Wireless Institute of Australia was held at Wireless House, on Tuesday, August 9, at 8 p.m., Mr. J. F. Wilson occupying the Chair.

The Minutes of the previous Meeting were read and confirmed.

The business of the evening, being a debate by prearranged speakers on "Panel and Cabinet Sets" versus "Isolated Apparatus," was then entered upon.

For demonstration purposes Amalgamated Wireless (Australasia) Ltd., loaned a complete cabinet set as used to equip tug-boats for emergency runs and similar expeditions.

The speakers in favour of panel and cabinet sets were Messrs. Stowe, Zech, Mawson and Blanchard; those in favour of isolated apparatus being Messrs. Perry, Steele and Cooke.

The subject proved an excellent one for debate, a great many important points being emphasised on both sides.

The principal points in favour of panel and cabinet sets were:

(1) The advantage of design of suitable arrangements which permit interchange of parts, thus giving confidence in trying out new circuit arrangements.

(2) Compactness of apparatus and absence of open wiring with its attendant risk of short circuit.

(3) Portability under war and emergency conditions.

(4) Reliability and appearance.

The principal points in favour of isolated apparatus were:

(1) Panel sets are not experimental but the result of experience.

(2) Flexibility enables innumerable rearrangements without difficulty or damage, which is the requirement of the *bona fide* experimenter.

(3) Open wiring is specially advantageous as it permits of speedy alteration of circuits, and if insulated wire is used the danger of short circuit is neutralised.

(4) Last, but no means least, the expense is a minimum.

In summarising, at the conclusion of the debate, Mr. Wilson stated that the method of grouping apparatus largely depended on what an experimenter required and how much he was prepared to spend.

A vote being taken, resulted in a majority of only three in favour of isolated apparatus.

SOUTH AUSTRALIAN DIVISION

The Monthly General Meeting of this Division was held at Alfred Chambers on Wednesday, August 3, the Chair being occupied by Mr. Hambly-Clark.

The Minutes of the previous meeting were read and confirmed. Application has been made for a transmitting license, and it is anticipated that in the very near future a broadcast will be transmitted at regular intervals.

The following nominations have been received for officers for the coming year: President, Mr. Hambly-Clark; Vice-Presidents, Messrs. H. Hawke and J. M. Honner; Hon. Secretary, Mr. C. E. Ames; Hon. Assistant Secretary, Mr. F. L. Williamson; Hon. Treasurer, Mr. R. M. Dunstone; Council, Messrs. Austin and Bland; Examiners for Valve Licenses, Messrs. W. J. Bland and J. M. Honner; Librarian, Mr. R. M. Dunstone; Library Committee, Messrs. C. Hatchett, K. J. Martin, H. L. Austin and C. E. Ames; Auditors, Messrs. J. M. Honner, K. J. Martin, H. L. Austin and H. Hawke.

One of the features of the evening was the excellent lecture on the Electronic Valve, delivered by Mr. J. M. Honner. Mr. Honner gave a number of diagrams on the blackboard of regenerative circuits and explained the working of amplifiers using "transformer," "choke" and "resistance coupling." He explained the advantages and disadvantages of "high" and "low" frequency amplification.

Mr. Honner treated his subject thoroughly and his lecture was greatly appreciated by all present, and a hearty vote of thanks was tendered him by acclamation.

A single-stage amplifier built into a cigar box was brought along by Mr. Austin and exhibited to all present, who complimented Mr. Austin on his excellent workmanship. All parts, including inter-valve transformer and valve socket, were constructed by himself.

Members are notified that next month begins a new year for this Division and that the Secretary will be pleased to receive subscriptions immediately.

"SEA, LAND and AIR"

THE AUSTRALIAN NATIONAL MONTHLY

— OF —

TOPICAL INTEREST

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

Edited by S. E. TATHAM.

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

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SEA LAND AND AIR

AUSTRALIA'S NATIONAL MONTHLY

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TOPICS OF THE MONTH

CONSERVATION OF FORESTS

AUSTRALIA, in common with other countries, has awakened to the fact that the policy of immediate gain over ultimate benefit is a disastrous one when applied to the handling of our timber resources. It was inevitable that a practice which allowed the wholesale denudation of our forests would sooner or later come to an end, and be replaced by a scheme of conservation involving a vast expenditure of time and money in restoring that which through carelessness and indifference we allowed to be destroyed.

Lord Novar, an authority on forestry, has more than once declared that our acquiescence in the destruction of so much valuable timber was nothing short of a national crime. Other experts have pointed to America and England, particularly the former, as examples of the serious position in which a country will sooner or later find itself where a policy of indifference is adopted in regard to forestry.

England has done her best to set her house in order, and an idea of the importance which America now attaches to the question may be gathered from the fact that President Harding has placed the matter of forest conservation in the forefront of the programme with which his admiration will deal. Quite apart from the serious position into which a timber famine will plunge us from a manufacturing point of view, there is good ground for believing that the destruction of green timber decreases the rainfall in our coastal areas, and at the same time increases the destructiveness of floods where heavy falls of rain occur suddenly. The soil in the denuded areas does not absorb so much water, and not being held together by living roots is more easily washed away.

Fortunately, the remedy for the destructive policy of the past is in our own hands, and in this State the Forestry Department is doing excellent work in the face of severe disabilities. The task is made much harder by reason of the misunderstandings which surround its activities. It is an erroneous belief that it closes forests or forbids us to cut trees. What it does is to intelligently regulate the cutting of whatever timber is required, and so enable the maximum quantity to be used without injuring the source of future supplies.

The Forestry Department's aim is to prevent us destroying the principal of our

forest capital, when all that is required for use is the interest therefrom in the shape of trees of mature growth. In this work it is the duty of every citizen of the State to assist.

It may seem a simple thing to cut down a sapling or young tree, and in truth it is, but like many another thoughtless act its continuance brings about serious consequences in the future. Our timber means a great deal to us, and in the worthy effort to secure its conservation the Forestry Department should receive our whole-hearted encouragement.

INLAND POSTAL SERVICES

THE network of our postal system extends to practically every nook and corner of Australia. It begins with the regular delivery of mail matter and the use of an extensive telegraph and telephone service in the big cities and stretches to the great outback, where the rattle of the mail coach is heard only once in several weeks and the telegraph and telephone are unknown.

The value and importance of an up-to-date postal service can best be appreciated by those who at sometime in life have experienced the change from the comparatively excellent service provided in the big centres of population to where the residents count themselves fortunate if the newspapers reach them before they are several weeks old, and to use a telephone means a journey of many miles to the nearest Receiving Office, if it so happens there is one in the district. There can be little doubt that as time goes on the missing links in our chain of communication will one by one be forged, and those who are far removed from rail and steamer service will be brought into closer touch with the outside world. It cannot be too strongly emphasised that every step taken in the direction of bringing about this desirable end is one of real progress, even though its actual cash value to the country may not be immediately discernible. Apart from the inducement which a regular postal service provides to people to settle in the interior of the country, it is a well earned recognition of the valuable work of settlement which our pioneers are performing when such facilities are extended to them.

One of the greatest drawbacks of living where means of communication are indifferent or non-existent is the dread of sickness or accident. It is easy to picture the anxiety of mind with which those who undertake the task of winning the out-back regions regard the possibility of a medical man's services being required. The ready resource and courage in emergency which is woven into the lives of the pioneers has helped them through almost unbelievable hardships, but whatever excuse there may have been in the past for allowing them to remain the objects of our admiration, rather than of our help, it no longer holds good. On humanitarian grounds alone, quite apart from its business aspect, there are few citizens who will be found to question the right, or wisdom, of the Government's action in extending postal facilities to the most remote localities where individuals are engaged in opening up hitherto untouched areas. Whether this service is to be by the old method of mail coach and telephone, or the modern system of aeroplane and wireless, it should not be regarded in the light of an expense, but as an investment which will sooner or later bear interest in the shape of increased national prosperity.

BRITISH NORTH BORNEO

A COUNTRY OF ROMANTIC BEAUTY

By H. J. BARTALON

Entrance to Government House grounds at Jesselton, Capital of British North Borneo.

THERE is, perhaps, no country in the world which exercises so great a fascination as Borneo. The mere mention of the name instantly calls before the mind pictures of dark, tangled, impassable jungle; of mangrove-swamps and alligator-infested rivers; of rugged, forest-clothed mountains rising in majestic grandeur to lose their summits in the clouds; of fierce Dyak head-hunters and Malay pirates. And Borneo is, indeed a land of surpassing interest and beauty. In this practically untamed country are all the elements of excitement and hair-raising adventure, all the mysterious charm of the tropic islands, the mysticism and the fatalism of the unchanging Orient, and, dominating all, the wonderful romance of the struggle of modern civilisation to tame this wild land, and force it to render up its vast riches for the benefit and progress of the race. Here one may see yet another concrete proof of the Britisher's marvellous efficiency in the field of colonisation, admire the pluck and determination with which he carries through almost impossible tasks, and feel justly proud to belong to a nation which produces men of the type who are, here as elsewhere, making the name of Britain one which the native reveres as standing for justice, understanding and help.

Before proceeding to a consideration of British North Borneo, it might be as well to digress for a moment to study the island as a whole, and the various States into

which it is divided, with their geographical relations to the section with which we are mainly concerned. Borneo is the central island of the East Indian Archipelago, and is shaped roughly like a pear, lying generally in a south-west to north-east direction, between latitudes 7 degrees north and 5 degrees south, and between longitudes 108 to 120 degrees east, with the widest part at the southern extremity. The total area is about 200,000 square miles, and the population is estimated at 1,850,000. The main mountain range extends parallel with the western coast for practically the whole of the length of the island, except at the southern end, where it turns abruptly to the west coast. This range, for most of its length, acts as the dividing line between the British and the Dutch possessions. Between this range and the west coast lie the British Protectorates of Sarawak and Brunei, British North Borneo lies at the top of the island, and extends from the west to the east coasts, while the rest of the country, comprising three-fifths of its area, is Dutch. This part of the island is particularly rich in oil, and its possibilities are being exploited to a considerable extent. Balik Papan is the principal port.

Sarawak is the southernmost of the British possessions, and comprises a territory 42,000 square miles in extent. Its population is about 600,000, partly native, but largely Chinese, as in the other parts of Borneo. This country is ruled by the Rajah Brooke, the romantic history of whose family is too well known to require enlarging upon here.

Between Sarawak and the south-west corner of British North Borneo lies Brunei, another British Protectorate. This State is a very ancient Sultanate, but most of its glory has long since departed, and it is only owing to the fact that Brunei is under British protection that it has been able to maintain itself as a separate State at all. Its area is 1,700 square miles, and population 25,000, of whom 15,000 are herded in the capital city of Brunei.

British North Borneo.

Just forty years ago, the British North Borneo Company was formed under Royal Charter, for the purpose of developing the territory from which it takes its name. The Company controls and administers the whole of the functions of Government, under the control of the British Colonial Office, by which all appointments to responsible positions in the Executive Offices must be sanctioned. The same system of training young British officers for the Government service applies here as in other British possessions.

The area of the State of British North Borneo is 32,000 square miles, with a population of approximately 230,000, mainly Malays, Javanese and Chinese. The capital is Jesselton, on the west coast, where the Governor resides. The principal town, however, is Sandakan. This port lies on the route of most of the steamship companies operating between Australia and the Far East.

The whole State is divided into five divisions, called Residencies, each having a Resident Magistrate, and being managed more or less independently of the others, but under the control of the Legislative Council, which meets at Jesselton under the Presidency of the Governor. All the executive positions, of course, are filled by Englishmen, having as their subordinates Cingalese, Chinese and a few Malays.

Education.

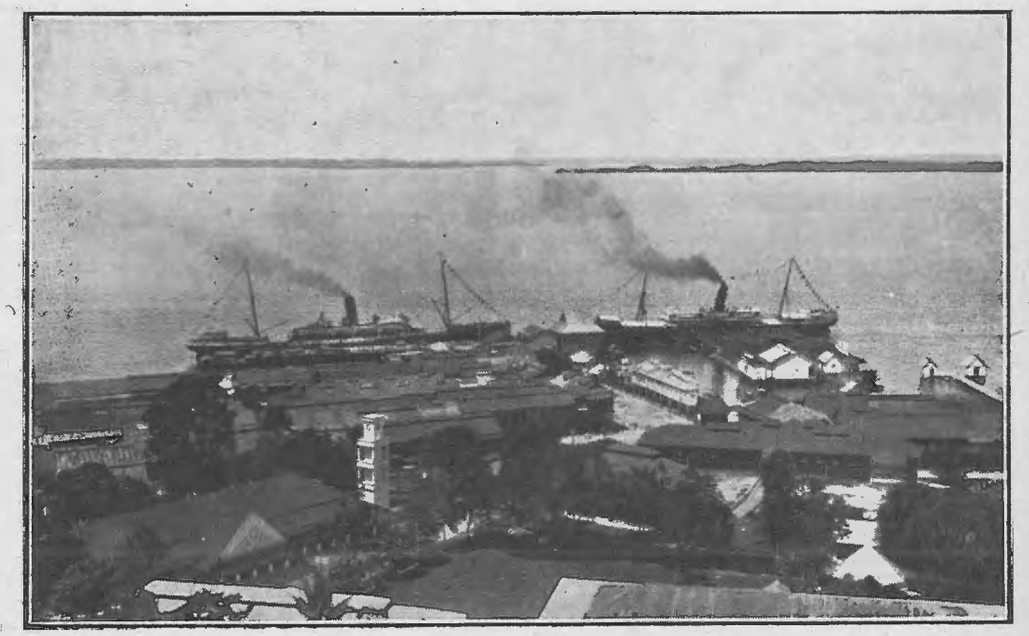
For the year 1919 there were twenty-eight schools in the territory, having a total attendance of 1,094 scholars. Three languages are taught, English, Chinese and Dusun or native. It is a significant fact that of this number 721 were taught English, 264 Chinese and 109 Dusun. The total expenditure on education for 1919 was 5,234 dollars, showing an increase on the 1918 figures of 280 dollars. The greater number of schools are run by various Missions, receiving a capitation grant from the Government.

Money.

The currency used is issued by the British North Borneo Company, and the standard is the dollar, which is at par with the Singapore or Straits dollar, and equal to 2s. 4d. sterling. The subsidiary coins are one cent (copper), two and a half cents, five cents (nickel). Also, there are notes for twenty-five cents and fifty cents. Then there are notes for one, five, ten, twenty, fifty and one hundred dollars. At the present time, the exchange ruling in Sandakan is eight dollars to the Australian pound note, and eleven dollars for the sovereign.

Labour.

All the manual labour in the State is performed by the native labour, and imported Javanese and Chinese coolies. These latter are brought in under a system of indentures to work for stated periods, and at the expiration of the term they have the option of re-engaging or being returned to their own countries. In the five Residencies there are, altogether, twenty-one districts, and each district has an officer whose business it is to make periodical visits to the various plantations and works within his area, to see that the coolies are being well treated and to act as adjudicator in disputes concerning the terms and conditions of labour.



Sandakan

The shipping centre of British North Borneo. The photograph shows two popular Australian liners in the port. The vessel on the left is the China mail steamer *Hwah Ping*, while on the right is seen the E. & A. mail steamer *Eastern*.

As is usual in all Eastern countries, a very large proportion of the hard work is done by women. Besides the indentured coolies, large numbers of both Chinese and Javanese come every year to Borneo as "free" labourers, to work in the various industries.

Public Works.

It is particularly in the matter of public works that the greatest strides have been made. Recognising from the outset that every endeavour to improve and exploit the country would be more or less futile without means of communication, the Government has concentrated upon this problem more than any other. From the rugged, densely-wooded nature of the country, it may be easily imagined what an herculean task the making of roads has been. The first roads, of necessity, were made in the various towns and settlements, and it is only within the last few years that attempts have been made to drive roads into the interior. The towns of Jesselton and Sandakan may boast roads which would be a credit to many bigger and older cities, and which compare more than favourably with the roads in the majority of the cities in the Commonwealth. The biggest undertaking at present on hand is the making of a road to connect Jesselton and Sandakan. The places are approximately one hundred and fifty miles apart as the crow flies, and the road will have to be made through some of the worst country on earth, and, when completed will be between two hundred

and two hundred and fifty miles long. At present the head of the road is about ten miles from Sandakan, and there is not one straight stretch of over fifty yards. The same difficulties are being experienced by the engineers who are building out from Jesselton.

The sums spent on roads have already been enormous, and in Sandakan Residency alone, in 1919 (the latest figures available), the expenditure on roads was well over twenty-thousand dollars.

In addition to the main and town roads, practically the whole of the country has been covered with a network of bridle-paths, which although vastly inferior to even poor roads, have still been of tremendous advantage, not only to Government officials, but to men engaged in commercial pursuits, and to the natives.

Other public works have been the building of substantial sheds and wharves at the various ports. At Sandakan, the principal port, the Customs wharf is amply sufficient for the vessels using it, and next to it is a commodious coaling-jetty capable of accommodating vessels drawing up to thirty feet of water.

Electric light and power plants have been installed in several of the larger towns, and Sandakan is to have its streets electric-lit within a very short time. Also, the powerful wireless stations at Jesselton, Sandakan, Tawau and Kudat, are supplied with power from these plants.

Railways.

At the end of 1919 the Government of British North Borneo was operating one hundred and seventeen miles of railway, which was open for passenger and goods traffic. The main line runs from Jesselton to Beaufort, a distance of fifty-seven miles. At Beaufort the line branches, one fork going to Melalap, a distance of forty miles, and the other to Weston, twenty miles. In considering the amount of work entailed in the building and maintenance of this railway, we must take into account the fact that, during 1919, traffic was blocked no fewer than ten times on account of slips and washaways only. On four of these occasions the hold-up lasted at least a week, once for sixteen days, once for ten days and twice for a week. And this was a good year.

The railway revenue for 1919 was 230,843 dollars and the expenditure was 306,098 dollars, thus showing a deficit of 75,255 dollars.

Shipping and Trade.

The import and export of goods is showing remarkable increases under both headings. To quote: The value of imports increased from 6,525,925 dollars in 1918 to 7,930,583 dollars in 1919, while the value of exports increased from 8,735,092 dollars in 1918 to 12,462,763 dollars in 1919, the whole volume of trade showing an increase for the year of 5,132,329 dollars, or 33.63 per cent. The particularly gratifying point about the increase is the excess of exports over imports of more than 40 per cent.

The main imports are rice, flour, grain, opium, kerosene and tobacco.

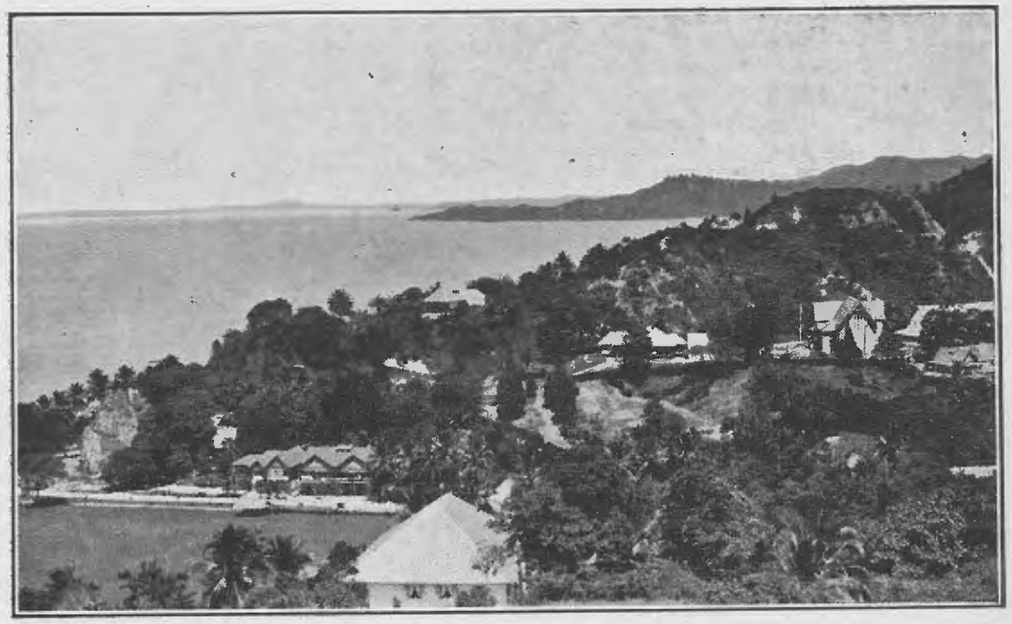
The principal lines of exports are rubber, timber, copra, and rattan. Another large line of export is tobacco, the yearly value increase of which was 1,543,718 dollars, or just under 410 per cent.

Another line which is exported in large quantities is coal. This is mainly obtained from the island of Labuan, which lies off the west coast, some distance south of Jesselton. At the cheap rates quoted, this coal is a powerful competitor with the Chinese and Japanese coals, which are much more expensive, although the former is very much inferior and the latter about equal to Labuan coal.

Largely on account of the coaling facilities afforded by Sandakan, there is a very fair amount of shipping utilising the port. It is fortunate enough to lie near the route of the Eastern and Australian S.S. Company's vessels on the China-Japan run, and on the route of the vessels of the Australian Oriental and the China-Australia Mail S.S. Company running between Australia and Hong Kong. In addition to these ships there are the Straits Settlements S.S. Company, and the Indo-China S.N. Company running regular lines to Sandakan and other ports from overseas. As overland transport is still in the elementary stages, it necessarily follows that there is a fair amount of coastwise shipping. The total tonnage of vessels entered and cleared at the ports of British North Borneo for 1918-19 was 655,846.

Sandakan.

Probably the place of most interest to visitors to Borneo is Sandakan. This port is distant two days' steam from Manila, four from Hong Kong, the same from Singapore and seven from Thursday Island. It is beautifully situated on the northern shore of Sandakan Harbour, rising gradually up the slope of a ridge. If one is sufficiently fortunate to arrive in the early morning, the beauty of the entrance is not easily forgotten. In the soft, pearly light of the tropic dawn the steamer approaches the sheer redstone cliffs of Barhalla Island until they seem to tower almost overhead. Then turning, she runs past the leper settlement, a row of leaf-thatched native huts, tucked into a cleft of the cliffs, fronting a beautiful sandy beach. Next rises the outermost point of Sandakan, a palm-topped bluff, with three or four grey native huts just visible through the vivid green of the undergrowth. Rounding this point there comes into view the town itself, a mass of red-roofed houses on the lower levels, the white clock-tower standing out vividly against the splendour of green and red, the blue wood-smoke from the morning fires curling lazily upward, and the dull murmur of many voices, sounding like the beating of surf on a distant beach, and which one soon learns to associate always with Eastern cities. On the higher slopes of the ridge, seemingly perched precariously on inaccessible eyries, are the bungalows of the European residents, and above all, standing out starkly from the prevailing green and grey, the vivid red slash of the cutting round the top of the bluff. From this cutting, later in the day, is obtained a marvellous panoramic view of the whole of Sandakan, the Harbour, and the mangrove country for miles on the opposite shore. A motor drive round the town, and then out to the present termination of the Jesselton road becomes a blurred memory of perfect roads, shady lanes which might almost seem to be in England were it not for the heat and the vegetation, half-caught glimpses of pretty bungalows hidden among the dense tropical undergrowth, patient, plodding coolie women struggling along under back-breaking burdens, and almond-eyed, indescribably dirty children peering shyly from the verandahs of the native houses.



A view of Sandakan, looking east. In the bottom left hand corner is seen the recreation ground.

In the cool of evening a world of wonder unfolds itself before the stranger in the streets of the native town. Curious hanging signs in Chinese characters line the streets, relieved here and there by one written in still more curious English, and the nerve-racking clatter of wooden shoes,

the harsh Chinese speech mingle with the purring croon of the soft-voiced barefooted native. And, over all, through all, the pervasive, indescribable smell which is inseparable from the Eastern town.

Then to the "Gambling Farm" to while away an hour watching the impassive Orientals at the inevitable "Fan-Tan." This gambling farm is quite the institution of the place, and has two floors; one, opening directly off the street and having about forty tables, is for natives, whilst the European is catered for in the upstairs rooms. The popularity of gambling as a form of amusement may be gauged from the fact that the owners of the farm pay taxes amounting to many thousands of dollars per annum.

Life in Borneo.

Of necessity, life as one must live it in out-of-the-way places, does not afford all the comforts and conveniences of more civilised countries. Most particularly does this apply to tropical countries such as Borneo. For any man accustomed to life in the open these places offer many amusements and enjoyments which he would, in all probability, fail to find elsewhere. Hunting and fishing there are in plenty, and of the best; swimming and sailing will pass many an idle hour for him, and at other times there is always the club. Even for a man in a sedentary occupation, as the hours at office are necessarily short, by reason of the heat, it would possibly be beneficial, and, once having become acclimatised, he would never wish to return to the old life.

But, in the case of a woman, most of these things do not apply. Perhaps the greatest compensation Borneo could offer her would be the replacing of inefficient servants by Chinese boys, who are unquestionably the ablest and most willing servitors of any. Social life, of course, there is, but in small communities there is practically no break to the monotony, and consequently the woman, having nothing to occupy her mind, finds that time passes too slowly, and, almost inevitably, she becomes discontented.

AMERICA'S UP-TO-DATE AIRSHIPS

Regardless of the outcome of the spirited controversy now raging over the comparative advantages of aircraft and battleships as America's first line of defence, both the United States Army and Navy are to have more lighter-than-air ships—orders for three large dirigibles and thirty-eight observation balloons having just been placed with the Goodyear Tyre & Rubber Company.

Two patrol and scouting airships of 180,000 cubic feet gas capacity will be completed for the Navy next spring. A dirigible of similar size, but of a special Goodyear design, will be completed for the Army by November. All three will be tested at the Goodyear-Akron air station.

The military airship to be built for the Army will have many new features of design that will make it the most up-to-date craft in either arm of the service. It will be the first dirigible in America to have its motors in the car instead of in separate power units. Two propellers will be driven by bevel gears at a two-to-one ratio, with transmission placed on outriggers instead of the motors driving direct to shafts. This will allow the engines to run while the propellers are idle, by throwing out clutches, and will also permit propellers to be reversed—a new feature that will permit greater facility in landing. Either motor can drive both propellers in the event that one motor develops trouble. With both motors inboard, they can be overhauled in flight much easier than if they were on outriggers, as in the present types of airship.

The Army ship will be one hundred and seventy feet long and forty-five feet in diameter. It will be powered by two one hundred and twenty-five horse-power Aeromarine motors, which will operate at sixteen hundred revolutions per minutes, but owing to the reduction gear, the propellers will make but eight hundred revolutions per minute, giving greater efficiency at higher speeds. A speed of sixty miles an hour is expected. The ship's "ceiling" is ten thousand feet.

The gas bags will be of pony blimp shape—"fatter" than other types—thus decreasing head resistance.

The car will be entirely enclosed and will house a crew of six, although three men can operate the dirigible for peace-time purposes.

The Army will use this airship probably for border patrol, while the two Navy ships will be used for scouting and observation.

A RIDDLE OF THE SEA

THE PUZZLING STORY OF THE "MARIE CELESTE"

By "ARGONAUT"

Oh! night and day the ships come in,
Trim vessels, great and small,
From Port o' Spain, from Sydney Town,
From Rio and Funchal.
But the fate of one ship's company,
Alas! o'ershadows all.

STATEMENTS, more or less inaccurate, have appeared in the press recently which revive memories of a mystery of the great ocean dating back to the days which, for many Australians, still bear a peculiar atmosphere of romance; the days when the graceful clippers lifted their tall spars of canvas to the winds, and swept proudly through the Trades, the Tropics and the Roaring Forties. It is a mystery that is probably unique in the annals of the seven seas, and although it has appealed to the imagination and inspired the conjecture of Sir Conan Doyle, Barry Pain, Arthur Morrison, and other writers, no solution has yet been propounded which has proved acceptable to the blue water mariner.

Morley Roberts is a writer of great imaginative powers, and moreover, is possessed of a practical knowledge of sea-faring life, yet he has confessed that, after grappling with the perplexing problem for many years, he has at last been driven to the conclusion that a rational solution based on the known facts is a sheer impossibility. It has to be recognised, too, that even if such a theory were evolved as would admirably fit the facts, it might still be a long way from the true elucidation of the enigma.

A Tantalising Puzzle.

As a rule, when a vessel sailing the high seas on a lawful mission encounters another that has been abandoned, the cause of such abandonment, if not readily apparent, is ultimately revealed in some way or other; but the case of the *Marie Celeste* has factors which combine to form a problem that for half a century has completely baffled any reasonable explanation. So far as has been ascertained the essential facts underlying the mystery are briefly as follows:

On December 13, 1872, the American brigantine *Marie Celeste* sailed into the port of Gibraltar, manned by a portion of the crew of the British brig *Dei Gratia*. On the same day, when the last-named vessel also entered the port, her master reported to the authorities that eight days previously, being then in Latitude 38° 20′ north, Longitude 17° 15′ west, he had encountered the *Marie Celeste* with not a soul aboard, although as far as he could see, there was not the slightest reason for her abandonment. There was an ample supply of provisions and water on board, no attempt had apparently been made to scuttle the vessel, while the general condition of the hull, masts, sails, rigging, etc., precluded the notion that she had been subjected to any of the ordinary perils of the sea.

All this was puzzling enough, and the mystery was greatly aggravated by the fact that the ship's boats were in their usual places, and had obviously not been requisitioned in connection with the departure of the crew. The whole of the ship's papers were missing, with, however, the exception of the log book, which was found in the cabin, and showed that the vessel was from Boston, U.S.A., bound for Genoa.

The last log entry had been made at noon of November 24, when in Latitude 36° 56′ north, Longitude 27° 20′ west, but entries were continued on the log slate till 8 a.m. on November 25, at which hour the ship was sailing an easterly course and six miles due north of the island of St. Mary—one of the Azores. In the normal course of events, the next log entry would have been made at noon on the same day, but as no such entry appeared the natural conclusion would be that sometime between 8 a.m. and noon on November 25, the whole

ship's company in some inscrutable fashion and for some equally mysterious reason had vanished.

Was it Mutiny ?

But here must be considered a factor of the problem which encourages the belief that the disappearance was due to some tragic happening in the nature of a mutiny. The master of the *Dei Gratia* testified that between November 25 and December 5 (the day he picked up the derelict) the wind had been blowing continuously from the north; and he likewise stated that the *Marie Celeste* was on the starboard tack when he found her, with only her jib and foretop-mast stay sail set. Consequently, if the whole of the crew had abandoned the ship on the day the final entry appeared on her log slate, she surely would have drifted to the south, and could not possibly have made her unguided way north and east to Latitude 38° 20′ north, Longitude 17° 15′ west, the position in which the *Dei Gratia* found her. Comparing that position with the vessel's position on November 25, six miles north of St. Mary, the conclusion is warranted that some, if not all, of the crew were aboard for at least several days after the last log entry was made. A further indication that the vessel was short-handed on those last days was that only two of her small sails were set when the *Dei Gratia* picked her up.

However, on her arrival at Gibraltar, the *Marie Celeste* underwent a close overhaul, above and below deck in the hope of finding something that would explain how and why she had become a derelict on the high seas. But no such clue was ever found. The vessel proved to be in every respect thoroughly seaworthy, and all attempts to pierce the veil of mystery surrounding her proved futile.

Some Far-Fetched Theories.

No member of the crew ever turned up to tell his tale, but in the effort to solve the mystery theories innumerable have been broached during the past half century, all of which have alike failed to survive the criticism of practical sailormen. Piracy may be set aside, for although the barbarities perpetrated by the Huns in the North Atlantic and elsewhere during the Great War, constituted piracy in its most execrable form, it is tolerably certain that in 1872 there were no modern Captain Kidds flying the "Jolly Roger" in the neighbourhood of the Azores. It is just as impossible to believe that all hands suddenly went mad and jumped over the side, while the condition of the vessel clearly proved that she had not been ashore, involved in a collision, or that a hurricane had swept every soul into the sea. A theory of a decidedly *bizarre* character was elaborated in an English periodical by a writer who, seemingly, drew some of his inspirations from Hugo's "Toilers of the Sea." According to this magazine, the only explanation possible that would fit the known facts was that the whole of the ship's company had been devoured or carried overboard by a gigantic octopus, or devil-fish. Such a theory collapses at once, however, unless we are willing to believe that the octopus, after it had disposed of the crew had gone down the companion way and swallowed the ship's papers by way of dessert.

A Bogus Survivor Appears.

But of all the many attempted solutions of this mystery, the most preposterous was that given in an English magazine (*The Strand*) some ten years ago. It took the form of a narrative of what happened to the crew of the *Marie Celeste*, as told by an alleged survivor, and so strongly did the yarn impress the magazine editor that he felt impelled to say in a foreword that he could discern the ring of truth in every line of it. All the same the alleged survivor stated in his first sentence that the *Marie Celeste* had sailed from New York, when as a matter of fact, she had taken her departure from Boston. In the next sentence he averred that the vessel was a brigantine of six hundred tons, a statement which alone was quite sufficient to show that the whole yarn was bogus, for no shellback ever saw or heard of an ordinary mercantile windjammer of six hundred tons that was rigged as a brigantine. The vessel was really a brigantine of one hundred and fifty-six tons register. Possibly the magazine that published the story did so in good faith, nevertheless it bristled with blunders and distortions to a degree that completely shattered its claim to be considered a true and faithful account of the tragic fate that overtook the crew of the *Marie Celeste*. If the story teller had said that the vessel left port on a Friday, or that there was a black cat in the cuddy or a cross-eyed Finn in the fo'cs'le, these being the omens that in those days foreshadowed disaster to a ship or her crew, he might, perhaps, have imparted a little more of the true nautical flavour to his clumsily concocted tale.

A Blood-Curdling Catastrophe.

According to his account, what did happen was something like this: "The skipper had his wife and a female child of ten years or thereabouts with him. This child acquired the curious habit of spending most of her time on the foc'sle head; and to further gratify this peculiar propensity, her father ordered the carpenter to erect a sort of platform near the bowsprit where the child could sit in safety when the weather was propitious. Then came a time of storm and stress which apparently was the cause of the skipper losing his mental balance. One day, after a nonsensical quarrel with the mate, he dared that officer to swim around the ship in his (the skipper's company), each to be fully attired in his ordinary working garments. This challenge was duly accepted, and after the preliminaries had been settled, and presumably, after the skipper had taken the precaution to go below and place the ship's papers in his pocket, both men dived off the bows and started on their swimming match. The rest of the ship's company (including the skipper's wife and child, likewise the man who should have been doing duty at the wheel) utilised the platform mentioned above, as a sort of grandstand from which to view the contest between the skipper and the mate. But alas! in their eagerness to get a good view of the proceedings, the occupants of the extemporised grandstand so overweighted one side of the structure as to bring about its collapse, with the result that all hands were suddenly precipitated into the briny. To give an added thrill to the desperate situation, John Shark entered an appearance at that identical moment, and to spare the gruesome details, not a soul succeeded in regaining the ship's deck.

A Miracle Happens.

The only solitary survivor, as alleged, just managed, after a super-human struggle, to scramble aboard the platform that had been hurled overboard along with its occupants, and immediately afterwards lapsed into a state of insensibility. When he awoke apparently a few hours later, he found himself stranded somewhere on the coast of Africa, with a big woolly-haired savage rendering first aid. It may well be doubted whether any other human being ever lived previously to tell of such a miraculous experience. Unless the log book of the *Marie Celeste* was faked, and there is no reason to believe it was, it is certain that her crew disappeared somewhere to the north of the Azores, and the point on the African coast most adjacent to that group of islands is Cape Cantin, more than nine hundred miles away. Perhaps some readers can calculate approximately the number of weeks, or months, it would take a piece of wreckage to drift such a distance in the most boisterous part of the Atlantic Ocean, a part, moreover, where the currents are confused and prone to move in circles. At all events, the readers of the story were expected to believe that this piece of wreckage, carrying an insensible sailor, held together until in due time it drifted ashore, and after the survivor had recovered somewhat from the effects of his terrible experience, the kind-hearted savage who had rescued him assisted him to journey to Algiers. From Algiers he worked his passage to Marseilles and ultimately to England, where he served with a schoolmaster, in whose employ he remained until overtaken by Father Time some thirty years later. At any time he could have supplied the key to the solution of the *Marie Celeste* mystery, yet he preferred, for some occult reason, to keep his lips sealed on the subject for a period of thirty years. After his decease, however, the narrative summarised above was alleged to have been found amongst his effects, somewhat after the fashion in which the chart of Treasure Island was found in the sea-chest of Billy Bones, and given to the world as a true story.

No doubt many credulous persons believed it, nevertheless it can still be affirmed with confidence that this long-standing incident still remains unsolved, and in all probability will do so until the end of time. It is quite possible, however, if the true explanation were in some way or other elicited it might prove so amazingly simple as to cast ridicule upon all the elaborate theories that the mystery has so far evolved.

THE OLD BULLI MINE

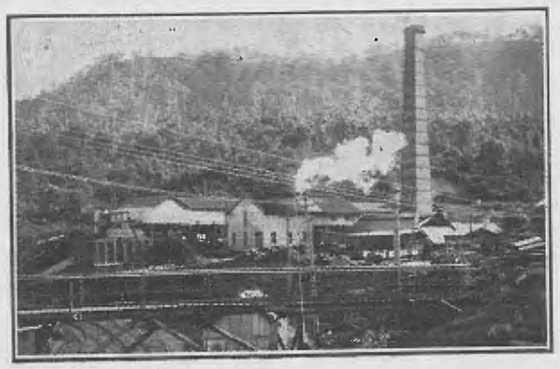
AN HISTORIC SPOT

By FLORA A. TIMMS

IT was a merry party of young folk, with a sprinkling of old stagers, that gathered round the mouth of the Old Bulli Mine one afternoon in January last to receive the safety-lamps which were handed round to each member of the party with the injunction to hold them steady, because, if they went out, it would not be possible to relight them in the mine. The two guides were courtesy itself, as they placed their charges in single file, one leading the way, the other bringing up the rear.

The change from the brilliant sunshine to the sepulchral gloom of even the opening passage was responsible for some slight mishaps which caused the old pit to echo with laughter, and for the first half-mile all attention was focussed on groping one's way.

The reflection of the dim safety-lamps had a strange effect on the optical sense; it seemed as if somewhere ahead there was "light o' day," and subconsciously one made for the light which tantalisingly led one on and on and, as the vision adapted itself, disappeared altogether.



The Old Bulli Mine; the scene of the great mining disaster in 1887.

The sense of mustiness was present all the time, only iron lungs could withstand years of the pit atmosphere, at least so it seemed to the layman.

A widening out of the passage enabled those ahead to form a group, until the rear-guard came up, and then, all laughter died down as the guides told the party that here was the scene of the big explosion of 1887, when eighty-four able-bodied men met their awful doom. The roof still bears traces of the terrific explosion, the concussion of which was so great, that, mercifully, every man's neck was broken by it. Only two men escaped. We had stood on the previous day beside the handsome monument bearing the names of the victims which the Government of the day erected to their memory, and we had seen in the little cemetery the long rows of graves with no other record on the tiny slabs than, "Bulli Disaster, May 27, 1887."

Having grown used to the darkness, we were able to take our bearings after the first mile, and almost pick out our way and settle down to ask questions.

Another widening out of the passage allowed a grouping of the party, who listened in amazement to what appeared to be the roaring of a mighty cataract, and only the amused faces of the guides prevented something like a panic. Putting on a brave front we followed through a huge door, and found ourselves in what appeared a room. The door was closed behind us, and we were confronted by another massive door, which, after being unlocked, we were invited to push open. This we were unable to do. The roaring was outside that door, and was nothing more than the air passing through its appointed way. So great was the pressure in that small space that the ear drums felt as if they were being pressed in. The guides shouted their information, and it was with intense relief that we wended our way back into the pit, to be taken to the stables, where twenty-seven beautiful draught-horses were housed. They are taken into the pit when seven years old and do not leave it again until pensioned off. It was just slightly arresting to find one's self one thousand feet below the surface of the earth in a blackness that was only relieved by two dim safety-lamps, listening to the talk of a man whose face we could not see, and whom we had met only a few minutes before.

A number of empty kerosene tins afforded the first seating accommodation available and having walked four miles, three of which were in the bowels of the earth, we gladly took advantage of them and plied the guide with questions.

The Old Bulli Mine has been worked for fifty years and is good for another fifty. The engine inside the mine can move five hundred and forty-two tons of coal, and about three hundred men are employed in the mine. Three to seven tons a day is the average output per man. There are ten tons of coal to every square yard. A white line running along the roof of the pit shows the position of the electric cable, which weighs forty-five pounds per yard. An open channel is left at the entrance to the pit through which the fresh air enters freely. After passing through all its courses, it becomes tainted with carbonic gas, and it is then diverted to the return channel. The men also leave the pit by this passage, as we did on our return journey; an undertaking we were not eager to repeat.

The party was exhausted on reaching the surface, but no one regretted having undertaken the six-mile underground journey which enabled us to gain a first-hand knowledge of the interior of the historic Old Bulli Mine.

HERE AND THERE

Wireless in Schools

It has long been recognised that there is no better time for interesting the men and women of the future in any project likely to be of benefit to mankind than during their schooldays. Just as a good or bad foundation of citizenship (according to training and environment) is fostered during those days, so also is it the most opportune time for interesting young minds in scientific and inventive projects. Hence it is easy to realise the valuable grounding in wireless telegraphy which the students at the Perth Boys' School, in James Street, are receiving through the installation there of a wireless set, with a radius of three hundred miles, over eight years ago. At the beginning of the war the plant, in common with other private installations, was dismantled by order of the military authorities, but selected members of the radio club were allowed the use of special instruments for the detection of illegal stations. Their labours in this direction were fruitful, no less than thirty being located during the first six months of the war. The plant at the school was reassembled about six months ago, but beyond "theory" work and "receiving," the operations are restricted until such time as the Commonwealth Government amends the regulations dealing with the sending of messages for instructional purposes.

Warning of Hurricanes

The establishment of a wireless station on the Willis Islands, off the Queensland Coast, has been definitely decided upon by the Commonwealth Government. An idea of the value of such a station may be gained from a recent statement by Mr. Hunt, Commonwealth Meteorologist, who said that by its aid it will be possible to receive and distribute tidings of the existence of a hurricane thirty-six hours earlier than at present. The weather bureau officials are restricted by the present inadequate facilities for receiving storm warnings, and shipping is consequently hampered through inability to learn of the direction and intensity of the cyclones which from time to time visit the Queensland coast. The establishment of the station referred to will, however, remedy all this.

ICEBERGS IN TASMANIAN LAKE

WEIRD EFFECT OF STORM

ABOUT the middle of July and early in August, Tasmania was visited by snow-storms such as occur only at long intervals of time. The August fall was the heaviest recorded in Hobart for thirty-three years, and the severity of the weather may be gauged from the fact that the Hobart tram tracks had to be cleared of frozen snow before the first car could start running. When such was the case in Hobart, where snow seldom falls, it can be imagined what the weather was like on the highlands. At the Great Lake, in the centre of the island, 3,000 feet above sea level, where the Government is expending two million pounds in generating 70,000 h.p. of hydro-electric current, the conditions were akin to an Antarctic blizzard, and the most weird effects imaginable were witnessed by the fortunate spectators.

The coastline of the lake is approximately one hundred miles long, and to traverse it from end to end by motor launch involves a long journey, to which is sometimes added an element of danger when the water is churned into heavy waves by the rough weather.

During the recent storm a party set out in a motor launch for the northern end of the lake, but could make only slow headway against a fast-gathering choppy sea. They were, however, afforded a magnificent view, for in the distance could be seen the ranges, rising abruptly to a height of four thousand feet, decked in a dazzling mantle of snow. All the time the gale was sweeping over the summits and through the gorges, lifting up in volumes the freshly-fallen snow and forming swiftly-moving columns of white.

Shortly after the party reached the jetty another fall of snow obliterated everything but the immediate vicinity. A couple of days later a frost caused a glistening whiteness over the whole surroundings, leaving only patches of sombre green amidst the white-crested, snow-laden trees. In the centre of the lake, where the heaving sea had prevented ice forming, a line of blue water showed itself.

The colour scheme at sunrise baffled description. Another interesting sight was that of a second motor launch crunching through the ice near the shore line as she made her way to the jetty. This little vessel had flated sides to protect her from damage by the ice. As far as the eye could reach the lake was frozen and covered with snow, having the appearance of a veritable Antarctic ice-field. It was most fascinating to watch from the shore the actual freezing of the lake. When Nature had finished her work the ice was five inches thick, but a remarkable feature was that instead of having a smooth surface it was rippled and jagged by the raging gale.

The next great spectacle was the breaking up of the ice. In a portion of the lake were some half-submerged trees, round which the waves had dashed furiously when the storm first began. The branches were deluged with spray which afterwards became frozen, forming blocks of ice, six to eight feet high. After the storm had spent itself warmer weather followed and the ice-field began to break up. It was then that great roaring and ripping sounds and occasional reports like thunder were heard. A narrow lane of open water first showed in the centre of the lake and gradually widened out. A strong wind caused the sea to rise, and on the second day the floating ice-floes presented a realistic picture of the Arctic regions. There were innumerable miniature icebergs of all sizes and shapes, some standing about two feet out of the water, and the dazzling effects of the sun on the lake and surrounding snow-covered heights, was magnificent.

It is interesting to learn that the Tasmanian Government has completed motoring roads from the Hobart and Launceston sides of the lake, and has decided to build a motor ferry to carry cars across the lake. This will open up a new and fascinating route for tourists between the north and south of the island. Motorists will be able to leave Launceston or Hobart after breakfast and reach either city in time for tea.

THE RADIO RAY

A STORY FROM "ADVENTURE"

BY

KENNETH GILBERT

INSPECTOR JERRY LYNCH, Immigration Service, entered the administration building with an unusual nervous springiness to his customary brisk step; a serious, thoughtful expression on his keen, rather dark face indicating that something of importance was on his mind. This last-named was usual enough, for, while bearing the title of immigration inspector, Jerry was really the head of the service's sleuths in this district.

Despite the fact that he was but twenty-seven, his training as a police detective had been so thorough and his work had met with such success that he had been induced to accept Government pay, for the flood of contraband Chinese slipping into the United States through the Government's fingers in this district had reached such proportions as to draw a frosty query from the head of the department to the local immigration officials.

And so Jerry, because he was familiar with the crooked streets and lanes of the quarter where the illicit immigrants invariably turned up, to say nothing of knowing every habitué of the city's Chinese quarter to a disconcerting degree, had been successfully importuned to act as a stop-gap. For three months he had been at work, and as yet there had been apparently no diminution of the stream of chattering Celestials. So far all he had gained out of his new job was a lowered respect for his ability as a sleuth, a contempt for politics and a heightened admiration for the men who had evolved the smooth system which baffled him.

He went directly to the office of the acting chief, Dobson, heralding his approach with no more than a tap on the door which separated the official's space from the outer area.

Dobson was quite in the extreme of what is known in the military curriculum as "at ease." His feet were on a corner of his desk, and he leaned back in his chair comfortably, so profoundly wrapped in his morning paper that he was oblivious to Jerry's arrival.

Haight, the secretary, a dapper, middle-aged man who to Jerry's mind always dressed with a show of affluence unwarranted in a Government clerk, merely looked up from the papers on which he was working and then resumed his task.

Jerry stood close to the acting chief's desk, his sleeve all but brushing the official's bald head with its rim of white hair—for Dobson was of that age when in the matter of appointment to office recognition of ability leaves off and political patronage begins.

"Chief," said Jerry, unconsciously dramatic, "the Chinese quarter is full of Chinks!"

"Eh?"

Dobson, startled by the other's proximity, sat up so quickly that his gold-rimmed spectacles all but slipped off.

The interruption nettled him. Besides, it was such a silly statement. As well say the sea is full of fish!

"I dare say, Lynch," he remarked sarcastically. "If it were full of Italians it wouldn't be the Chinese quarter, would it?"

Then the published words of a senator regarding the outlook for the party caught his eye, and his attention focused entirely on the despatch.

Haight, the secretary, apparently saw something humorous in the reports he was checking, for he smiled.

Jerry felt his cheeks burn and a wave of the disgust that had been growing in him for weeks sweep over him. This was politics. A doddering old incompetent in a position of authority in such an important branch of the Government, and the yellow school swimming through the net as if its meshes were of gossamer. He was sick of the whole thing. ——— it; he'd go back to the force!

He opened his mouth to tell the acting chief his personal opinion of the situation in its entirety when his eye caught some one standing at the door at the far side of the room. It was Clarke, the assistant chief; the real chief, said his friends.

Clarke laid a finger on his lips, and beckoned to Jerry. And the latter, with his ultimatum to Dobson undelivered, crossed the room and entered Clarke's office. Clarke closed the door.

"Sit down, Lynch," he said with a genial smile, "and give me the facts. I know what you mean by saying the Chinese quarter is full of Chinks; what I want to know is, how?"

Jerry had respect for Clarke. The assistant chief was but slightly older than himself, and that he was efficient and wrapped up in his work there could be no gainsaying. He it was who had been instrumental in bringing Jerry into the service, for inability to block the Asiatic horde had piqued his professional pride.

"How, I can't tell you, Mr. Clarke," replied Jerry Lynch, enthusiasm gaining the upper hand once more. "But that's what I propose to find out," he continued. "All I know is that every rabbit-warren in the quarter is alive with coolies to-day. We can throw a dragnet through the district, and make every one account for himself. But even then it is doubtful if we'd get half of them, with nearly every building there undermined by dugouts and secret passages."

Clarke nodded agreement.

"We can't raid them for another reason," he supplemented. "Our reputation is at stake. Already the wealthy and influential Chinese are kicking about what they term unnecessary raids and the newspapers are agreeing with them to the extent of saying that the contraband coolies should be caught before they ever reach the Chinese quarter. If we raid them again, we court a grilling by the press. And that is what will make the department heads at Washington sit up and take notice."

"But what is your theory about how this last bunch got in?"

Jerry turned to the window, from which one could gaze on the sweep of the harbour as if it were a mill-pond. It was a peaceful view; the small shipping clustered along the wharves or dotting the placid surface here and there; a ferry ploughing her way laboriously, while steamers of varying sizes headed inward or outward; a peaceful view that did not suggest from a distance the bustling activity it really represented.

"There!" said Jerry, pointing.

Clarke's eyes followed the direction of the other's forefinger. Far out in the bay, on the fringe of the anchorage, was a large steam yacht. Her lines were of the clipper order, the overhang of her proboscis-like prow being accentuated by a long bowsprit. Smoke curled from a thick funnel placed midway between her two masts.

From waterline to truck she was painted a slate grey, resembling that which is applied to Government vessels, and which, known as "war colour," is least distinguishable at distances on water.

"Why, that's the *Sylph,* Burke's yacht!" exclaimed Clarke.

Jerry nodded.

"Exactly," he said. "And I'll be frank in saying that I can do no more than suspect her. And yet every time that Chinatown gets a-crawl with coolies I look out there and see the *Sylph,* and discover that she has come in during the night. And almost invariably it is from a cruise in waters beyond the border, ostensibly an aimless pleasure jaunt.

"Another thing; why should he have her painted that slate grey, which easily camouflages in these hazy waters, when he could just as well give her some livelier colour?"

"But Burke is a millionaire; and anyway, how could he escape examination after arriving here from a port beyond the border?" asked Clarke.

"Easy enough, I think," replied Jerry. "In these thick fogs he could slip by our boarding-officers in the night, land his cargo, slip out again and then return to stand inspection.

"As for his money, how do we know he has any; and where did he get it? Who is he, and where did he come from? No one around here seems to know much about him, but I intend to find out just to satisfy my curiosity.

"And I tell you his boat smells Chinese. You can't coop up coolies in one spot for hours without the taint remaining. I hadn't been here two weeks before I paid him a visit.

" 'Come right aboard, inspector,' he told me, shaking hands at the gangway. 'Glad to have you pay us a call.'

"And then he took me all over the boat. Showed me fixings that I never expect to see again outside of a museum. But there was nothing Oriental about them. Just luxurious trimmings that any man of his apparent means would be likely to have.

"As we started down the main deck I saw three of his crew putting on the hatch-cover to the hold. It seemed to me they were working too fast; as if they were too anxious. So I just went up and had them lift off a corner. And while the smell that came up to me was mostly of formaldehyde and other disinfectants, I tell you it made me think of one of those holes down in Chinatown.

"I observed Burke looking at me rather closely, but the instant he saw I noticed his gaze he slipped into his old character again.

" 'Bilges certainly do get smelly; don't they, inspector?' he said. 'I just had ours cleaned out and disinfected. Had to do it, or the whole ship would get scented up.' Which struck me as being decidedly far-fetched.

"Next we came to a shack on the main deck.

" 'Your wireless room, I see,' I remarked, for—I don't think I've ever told you about it—but I've always been something of a nut on the subject of wireless. Got a set and a little laboratory at home, and when I'm off duty I'm always experimenting. Taught myself the code.

"So when we came to the wireless room my amateur interest was naturally aroused. Burke appeared bored, but he was polite enough about it. He took hold of the door-knob. The door was locked.

" 'Stupid of me to forget,' he remarked. 'Our wireless operator is ashore. Married man, you know, and I always give him all the leave possible when we're in port.'

"Which again struck me as being somewhat odd, though I didn't say anything about it.

"The blinds to the windows were slid shut. Aside from noticing that the *Sylph* seemed to have an unusually wide sweep to her aerial for an ordinary pleasure vessel, I didn't get anything there.

"Anyway I was not as fully convinced then as I am now that Burke is mixed up in this matter."

"The wireless end of it," remarked Clarke, "seems to be eliminated by the fact that none of our operators on patrol boats has ever been able to intercept messages remotely relating to Chinese. And yet a ship brings those Chinese here, and they are run in when our patrol boats are elsewhere. Which convinces me, and I don't mind telling you—" and his voice lowered —"that I suspect someone connected with this office of being in league with the smugglers.

"Word of the disposition of our patrol cutters is flashed to the smuggling vessel—the *Sylph,* if you will—and the Chinese are brought in and landed. But how is word sent to that vessel, if not by wireless? Surely, she must stand by at sea, waiting until the coast is clear. And she'd stay far enough out so as not to be seen by every packet going in and out of the harbour."

Jerry jumped up suddenly, slammed his hat on the floor and jumped on it.

"——— muttonhead!" he exclaimed to himself. "Why couldn't I have thought of it before!"

Then, rather shamefacedly, he picked up his hat.

"Excuse me, Mr. Clarke," he apologised, "but I couldn't help bawling myself out. I think I've got the answer. They do get the word by wireless!"

"But how?" asked Clarke.

Jerry smiled and shook his head.

"Let me do this in my own way. If it's a flivver we can try something else. I'm going up to my laboratory now to do a bit of work. And I need some help. Send me a good electrician, a first-class armature-winder—one we can trust. To-morrow night I'll have the answer.

"See, they're getting under way now," and he pointed to the *Sylph,* which was beginning to belch smoke from her funnel. "Maybe they'll have a cargo of Chinks ready to be run in by to-morrow night, figuring it to be soft. Give me a man to help, and we'll surprise 'em.

"One thing more. Find out if our friend Haight belongs to a tong. I've been trying to place him ever since I came here, and now I think I have. When I was a cop the Hip Leongs and Bow Sings got to shooting up each other and we pinched a raft of 'em. If I remember correctly, our friend out there was trying to arrange bail for one of them. Used to be a lawyer, didn't he?"

Clarke nodded.

"That's the bird then," Jerry went on. "He and another lawyer in this town are the only white men I've ever heard of that

belong to a Chinese secret society. Did it so they could get Chinese law business, I understand.

"But let's be sure. Have Reynolds watch him to-night and tell me where he goes. See you to-morrow!"

* * *

Lights were beginning to glow at street corners and in shop-windows through a muggy drizzle when Jerry showed up at immigration headquarters for the first time in thirty-six hours. All the offices save Clarke's were deserted. Jerry found the assistant chief at his desk, and with him Reynolds, one of the inspectors detailed to Jerry's force.

"Got her," announced Jerry as he closed the door. "Tested and adjusted and rigged aboard the cutters. The testing is what delayed me, but she works like a charm now."

Clarke turned to Reynolds.

"Tell Lynch what you told me," he directed.

"It's this," said Reynolds. "Last night I trailed Haight when the office here closed. He went to the Carlton Hotel grill, where he met a man I've never seen before. A big fellow, two hundred pounds or more; greyed about the temples, smooth-shaven, probably fifty years old; a well-dressed, prosperous-looking business man, I figured."

"Burke!" exclaimed Jerry.

Clarke motioned him to silence, and Reynolds went on:

"After dinner they had a long talk. I couldn't catch the drift of what they were saying, as the nearest I could get to them was two tables away, and anyway I didn't want Haight to spot me. But pretty soon Burke, as you call him, looks at his watch and gets up. Then I heard him saying something about a long boat trip.

"They both went out and down to the water-front. There the big fellow climbs aboard one of these speed-boats—'sea-sleds,' they call them—and beats it at sixty miles an hour. Haight goes back uptown.

"He goes to his room at the Carlton, but comes out again in five minutes and starts toward the lower end of town. He zigzags back and forth kind of aimlessly, but by and by I discover that we're in the heart of the Chinese quarter. Once there, he steers a straight enough course for the Bow Sing Tong headquarters.

"Of course, I made no attempt to follow him inside, but waited. In about three hours he comes out and goes direct to his room at the Carlton. As it was then pretty late I figured he had gone to bed; so I quit."

Jerry looked at Clarke.

"I remember now," he said. "It was a Bow Sing gunman that Haight was trying to spring, the time he was fixing up bail. That's the tong to which he belongs. And it's the same outfit that is back of this smuggling scheme, for word is all over Chinatown that they're getting to be the strongest tong down there. Picking some choice coolies for members, to develop them into gunmen and hatchet-men.

"I know their joint well, because we searched it regularly every time there was a killing in the district. They've got rooms on the third floor of a brick building. In one end of the lodge-rooms is the biggest joss I've ever seen. Ten feet high if it's an inch, and four or five feet thick at the waist. But I wonder why Burke didn't go with the *Sylph* when she sailed yesterday?"

"Probably lingered to complete his plans, while the *Sylph* went on ahead to get her cargo of Chinks," was the logical deduction of Clarke. "He's aboard her now, for he could easily overtake her with his speed-boat. But how about this fog? How the ——— do you expect we can find the *Sylph* out there on a night like this?"

"If we can't then my theory is no good," responded Jerry confidently. "Fog or no fog, it's all the same if my guess is right. But, Lord, what a night for a murder—or a wholesale smuggling operation!"

Together the three went down to the Government wharf, where three patrol cutters, *Namaycush, Sturgeon* and *Grayling,* lay moored side by side. Jerry, leading the others, went from boat to boat, inspecting the wireless equipment of each.

Even to Clarke, who knew nothing of the mysteries of wireless, it appeared that a change had been wrought in the apparatus housed in the tiny cabins of each craft. Ordinarily the myriad of coils, shining instruments and switches was enough to baffle his comprehension, but to-night it seemed that each wireless set had enhanched its complexity.

There were additional coils, and, suspended over the receiving set, was something that looked like a gyroscope. That is, it consisted of two hoops of hard rubber, each wound with a single layer of copper wire. One hoop was smaller than the other, so that it could be revolved inside the larger hoop on a single shaft which bisected them. Jerry smiled wisely at the puzzled expression on Clarke's face.

"We'd better go aboard the *Namaycush,* Mr. Clarke," he said. "I've explained to the skippers how we are to work. We steam in single file straight ahead until we are outside the headlands. Then we swing in a circle five miles in diameter, play 'follow my leader,' and the *Namaycush* will lead. We keep doing that until we pick up what we're after."

Outside they found the fog almost impenetrable to vision, but by occasionally blowing their whistles they kept track of each other in the murk.

And so on the big loop they started, the *Namaycush* followed by the *Sturgeon* and *Grayling* in the order named. They had been steaming for half an hour, with Jerry hanging over the shoulder of the operator of the *Namaycush,* when the Sturgeon's operator broke in—

"Just heard them!"

Immediately Jerry ordered the *Namaycush* put about, and the other ships followed her. For five minutes the *Namaycush* forged ahead while her wireless operator kept the telephone receivers glued to his ears. Suddenly he started, listened a moment, then handed the receivers to Jerry.

As Jerry slipped on the receivers there came trickling through them the musical tinkle of a spark, the song of a high-frequency set—

—coolies and—

Then silence. So bold had the smugglers become and so cocksure of the infallibility of their system, that they were not even coding their messages! Jerry jumped for the wheelhouse.

"Back up fifty yards!" he yelled at the captain. "And signal the other ships we're going astern!"

Then he hurried back to the receivers again.

Silence still brooded in the ether void, while he felt the throb of the propellers as the *Namaycush* gained sternway. A minute, two minutes, passed. Then spoke the strange spark again.

"Tell the skipper to stop her right here!" Jerry directed his operator, "and give me the compass directions at right angles to our beam."

Apparently the operator of the strange wireless set was having difficulty in making himself understood, for he was repeating the message; spelling out the words with painful precision and exactness:

"Boss says to ——— with the cutters; we're going in. The fog is too thick for us to be spotted. Have vans at south turning-basin at twelve sharp."

"O.K." came back the response this time.

The wireless operator of the *Namaycush* was back, and with him was Clarke.

"Skipper says the directions at right angles to our beam are south-southwest and north-northeast," he reported.

"We've got them if our luck holds!" exclaimed Jerry.

"Have the cutters keep abreast, fifty yards apart, and run on a slow bell, Mr. Clarke. And be sure to steam exactly north-northeast!"

"But—" began Clarke.

Jerry shook his head.

"Not now," he stated firmly. "I want to do this in my own way."

And Clarke saw he would have to be content with that.

* * *

For an hour they steamed—*Namaycush* to starboard—maintaining their formation by keeping close enough to mark each other's lights in the blanket of fog. And yet the oily heave of the ground-swell was broken by nothing save their own wakes.

Suddenly a star gleamed through the murk, dead ahead of the *Namaycush.* The cutter slowed to a stop, while the star rapidly grew from third to first magnitude. The *Namaycush* veered more to starboard, the other two following suit.

The wall of fog ahead grew more opaque as a great form took shape. They could hear the ripple of a cutwater. And out of the pall a long jib-boom was suddenly poked. The *Sylph!* Without lights save at her foretruck, she was feeling her way stealthily through the night, relying on the sheltering mist to cloak her movements.

As if a command had been spoken, the cutters in unison backed clear of her path, then steamed ahead—*Grayling* and *Sturgeon* to port and *Namaycush* still to starboard—closing in on her.

"Heave to!" shouted Clarke at the darkened bridge of the yacht.

The command was echoed by the skippers of the cutters on the other side. A bell clanged inside of her, and she slowed to a stop.

Jerry, Clarke and Reynolds boarded her at her starboard quarter, while the others were clambering up the opposite side.

"Where's Burke?" demanded Clarke of a sailor who met them.

"Not aboard," replied the man uneasily, looking forward. "Who are you? What d'ye want?"

Without replying Clarke started forward. From that direction a pulley suddenly creaked; then there was a snapping sound, a yell and a splash. Clarke quickened his pace to a run. Reynolds and Jerry followed.

Suspended from a davit by a single piece of tackle swung a short, flat-bottomed craft of wide beam with an oversized gas engine. A frayed end of rope which dangled from the other davit explained what had happened.

"He's gone" exclaimed an ashen-faced deck-hand who stood at the davit falls, peering over the side.

"Who's gone?" demanded Clarke.

"Burke," was the reply. "Must have struck his head on the engine when the line broke. Served him right anyway, —— him, for tryin' to run out and leave us to face it alone!"

The water below the dangling speedboat showed no sign of life.

"—'s bells!" exclaimed Jerry to Clarke. "I'd forgotten. You two take a look at the Chinks; I've got to stop their operator from tipping off the gang on shore."

And he dashed for the wireless room.

But before he reached there he heard the hum of the motor-generator and the muffled voice of the singing spark. The *Sylph's* operator, a sallow little man, snapped off the power and leaned back in his chair as Jerry burst in the door. The little man grinned without fear.

"Too late," he remarked evenly. "Got a cigarette?"

* * *

They were reporting to Commissioner Dobson, and doing it painstakingly, so that he would understand.

"We have the *Sylph* with forty-six coolies and two hundred five-tael tins of opium which we have turned over to the customs men," summed up Clarke. "Burke is dead, and he'll probably always remain a mystery, as none of the prisoners seemed to know much about him. Probably the smuggling syndicate owned the yacht and merely financed him so that he could pose as wealthy and give them an excuse for running it back and forth between here and the border.

"But we rather fell down on the tong end of it," and he looked at Jerry with mock seriousness. "The *Sylph's* operator got word to them, and when we reached there the place was deserted. Probably we should have sent back one of the cutters to nab them first, but if Jerry Lynch hadn't made an error somewhere in his calculations he wouldn't be human.

"However, he found their wireless set. The blamed thing was inside of that big joss of theirs, and the aerial leads ran up through the walls to the roof. We don't know who operated it; probably Haight. At any rate he got away. He was their inside man here, we found.

"But I'll let Jerry tell you about the wireless end of it, and how they managed to get their signals through without having them intercepted."

"They were using what may be called a 'radio ray,'" explained Jerry. "The very latest thing in wireless communication. Ordinary wireless apparatus sends out waves in all directions, and any one can pick them up; this device concentrates them. Shoots them out just like a searchlight beam, and unless you get in the beam's path you can't hear a thing.

"Both the operator on the *Sylph* and the one at tong headquarters knew the direction in which to send their radio beams, and that is why we never heard them until we started swinging in the big circle that I felt would at some point cross the path of the ray. When we finally struck it I waited till it was at its strongest, meaning that it must be abeam, and then I had the skipper give me the directions at right angles to our ship's beam, figuring we had cut squarely across their line of communication. If we had taken the south-southwest, we would have brought up here in town; instead we steamed north-northeast, in which direction we knew the *Sylph* must be.

"The apparatus I rigged up for catching them was merely a loose-coupled receiving tuner, which permits unusually close tuning on wireless waves. That is, you can tune out all other ether waves except the one you want to hear. It had some extra coils which permitted us to cut in on extra long wave-lengths, which I figured they would be using.

"We have the *Sylph's* set and the one from tong headquarters. You'll have to excuse me from explaining them, because I'm not that far along in wireless. Marconi has been testing out the same kind of apparatus for months; and until he finishes he won't give out the details of it. How the smugglers got hold of the apparatus we don't know. Probably they stole the idea."

He paused.

"I—see!" said the acting chief after a minute, nodding his head wisely, although he saw but hazily. "Truly wonderful!"

And he held out his hand, beaming as he did so.

"And now I'll be frank with you," he went on confidentially. "I had begun to fear that you were a mere trifler when the other day you made that silly remark, 'The Chinese quarter is full of Chinks!' Now I am convinced that such inanity is no indicator of your capabilities!"

A NEW SOUTH WALES BEAUTY SPOT

A view of the fresh-water section of the Hacking River. One notable peculiarity of this river lies in the fact that throughout the whole of its fresh-water course it runs due north, being the only river in New South Wales which flows in that direction.

TIMBER RESOURCES OF NEW SOUTH WALES

HOW THEY HAVE BEEN WASTED

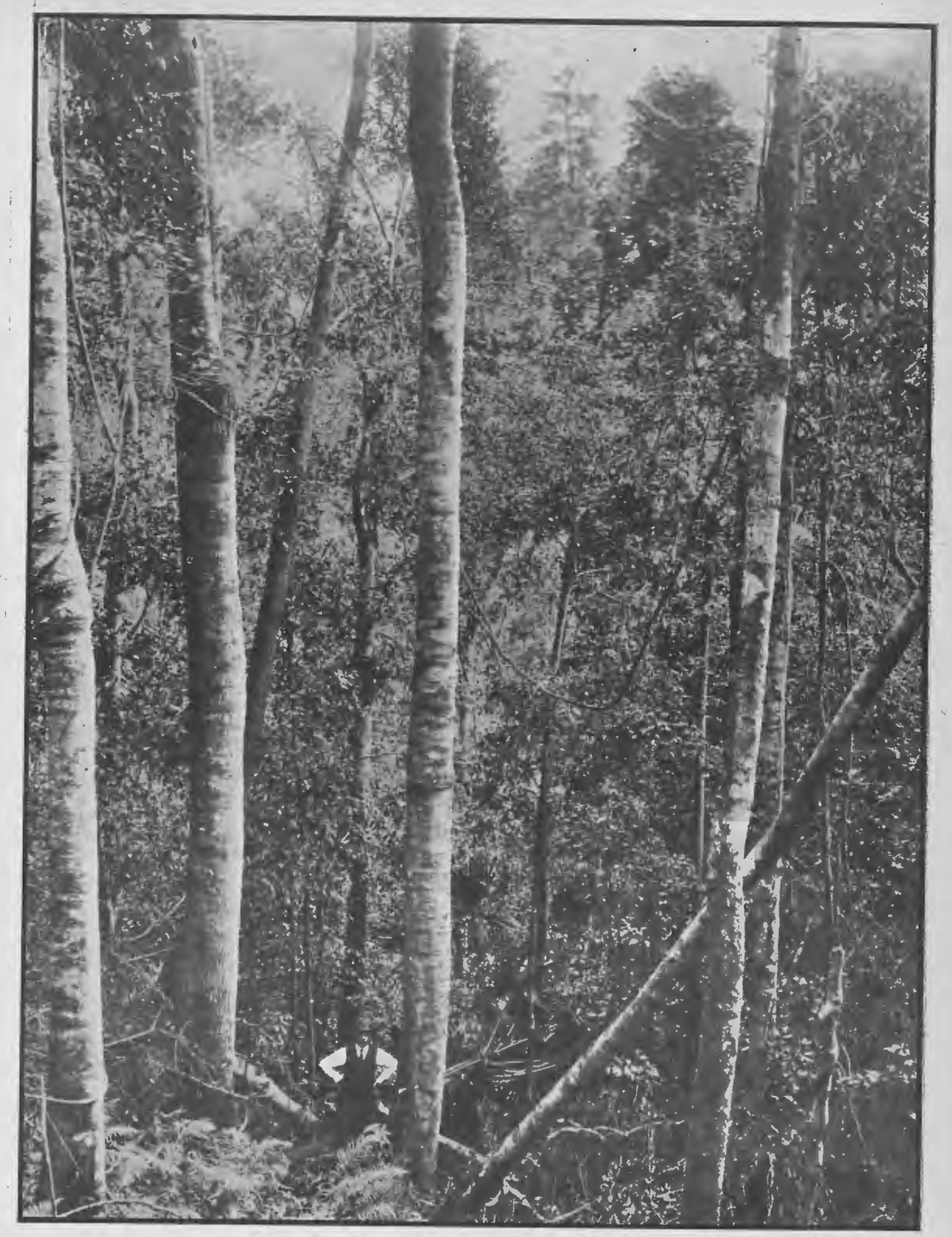
FORESTRY COMMISSION'S GOOD WORK

THE importance of an undertaking is oftentimes lost sight of simply because people will not view it from more than one angle. An instance of this was mentioned by a recent distinguished visitor, Lord Northcliffe, when speaking of the disarmament conference at Washington. Its importance, he said, could best be realised by picturing the consequences to Australia if it failed. This is exactly the light in which the people of this country should view the efforts of the Forestry Commission to conserve the source of our future timber supplies. The success of their objective means much to this country, both from a commercial and utility point of view. On the other hand, failure indicates that it is only a matter of time until our timber resources are exhausted, and we are either compelled to import on a larger scale than ever before the supplies necessary to meet our needs, if other countries can be found to supply them, or we must do without the countless essential articles which timber is now used to manufacture. This latter prospect is not to be lightly regarded, and while other countries estimate the value of our timbers so highly it is surely not too much to expect that our own citizens will do their part in assisting the authorities to preserve such a priceless possession. Only recently the Acting Prime Minister received a report from New York that our timbers are attracting much attention in America, which is not surprising when it is remembered that at the Panama-Pacific Exposition in 1915, our exhibits of timber excited the keenest admiration.

A history of the evolution of forestry in New South Wales makes interesting reading. It is the old, old story of an unappreciated possession, destroyed through ignorance and neglect, coupled with an almost criminal indifference on the part of those charged with the administration of affairs in this country. An idea of the carelessness and indifference manifested by the community during the past one hundred years, may be realised from the fact that in that time an area of 30,000,000 acres of forests was reduced to 11,000,000 acres. A still more striking lesson, in hard cash, of the consequences of such devastation is revealed by the payment of nearly eighteen million pounds sterling for raw timber imported into the State during the past twenty years. This represents an average of nine hundred thousand pounds per annum, or two thousand five hundred pounds per day, including Sundays.

The most regrettable feature of the whole affair is that the officials of this State allowed the policy of waste to continue long after other countries had placed the control of their forest resources under expert management. The question of settlement engrossed attention to the exclusion of all other matters, and it is easy to realise what followed, when the Government policy was to encourage those taking up land to destroy all timber thereon, irrespective of its value for milling purposes. One high official declared that he "hoped to see the day when not a tree would be left in the land," and when reminded that the development of the country would be impossible without timber, replied that when the latter disappeared a substitute would speedily be found.

About fifteen years ago a Royal Commission was appointed to enquire into the administration of forests in this State, and in the course of a drastic report, which caused a stir at the time, the whole position was laid bare. It was shown how the interests of forestry had been subordinated to the interests of settlement, with the consequent destruction of vast areas of valuable timber. The position of the pioneer was necessarily an invidious one. However much he may have felt inclined to preserve the timber on his holding he was faced with the necessity of having to make



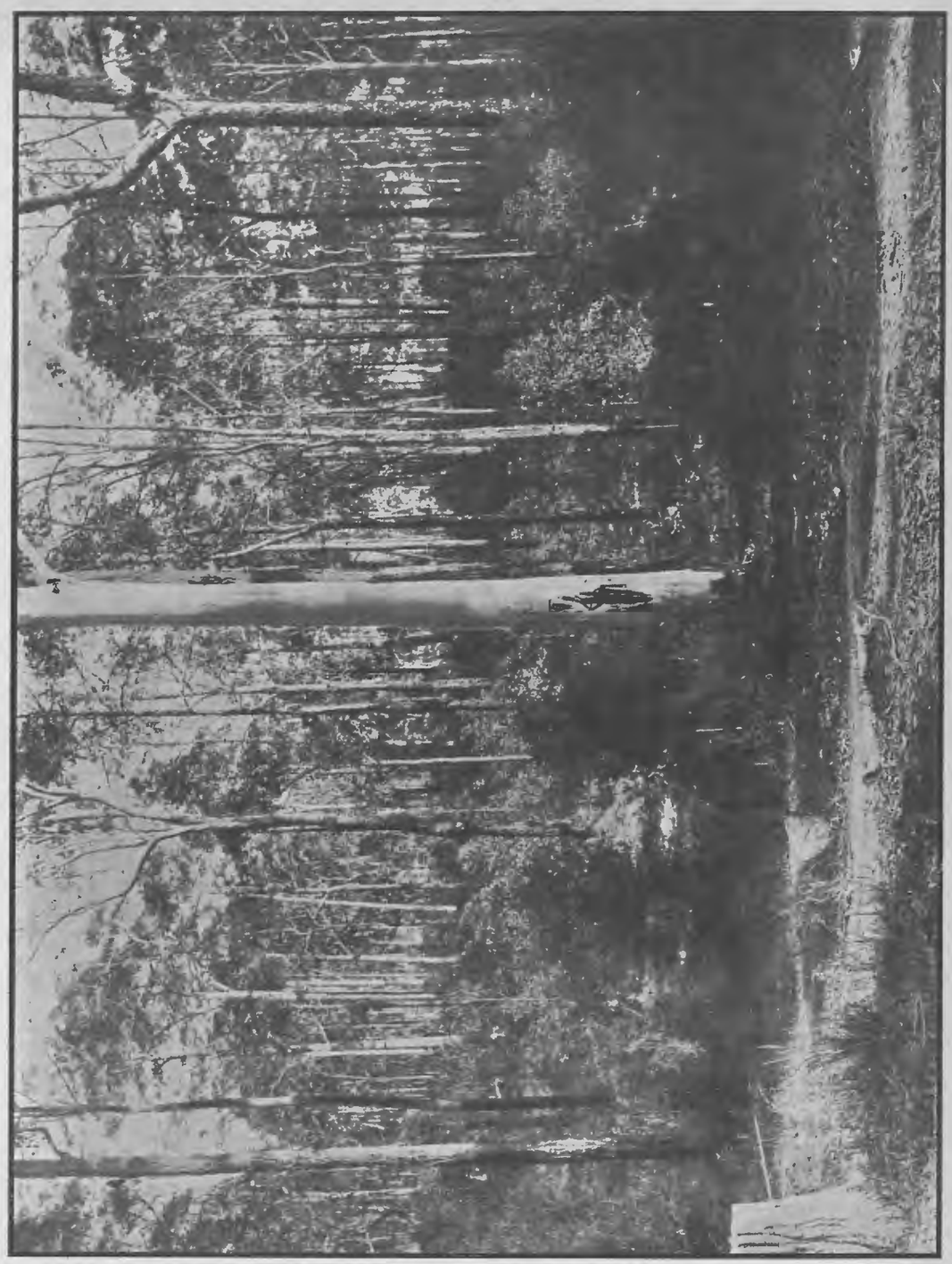
Red Ash ("Alphitonia excelsa"), Narara district.

a living, and the very act of felling the trees meant their total destruction owing to the absence of facilities for getting the logs to market, even if a sufficient demand for sawn timber had existed to make the undertaking a payable one. It was the same in regard to the young timber. Agriculture and stock-raising were the industries of those days, and as they could not be successfully carried on in timbered country it meant that axe and fire were employed to make the land fit for occupation. Even in those days the forests were rightly regarded as the property of the State, but it was one of the unwritten laws of the time that whoever felled a tree owned it. This gave a license to those who wished to exploit the magnificent cedar resources which then existed, and the policy of destruction became so widespread that the resources of this particular timber were almost exhausted.

The Forest Act of 1877 could hardly have been expected to accomplish any useful work, owing to its quick transfer from one department to another and back again, during the first few years of its existence. The formulation of a policy, let alone the administration of same, was impossible under such conditions, but the band of enthusiasts who were behind the movement for the conservation of forests never relaxed its efforts. In 1889 the Government established a Department of Forestry and appointed *a trained nurseryman to control it.* As might have been expected, such an innovation was a failure, and in addition to the expenditure of large sums of money on ill-directed schemes of planting and administration, it brought the whole undertaking into public ridicule and contempt. In less than five years the nurseryman was dismissed, and the department relegated to a branch of the Public Service. A few years later another attempt was made to set things in order, but the opponents of reform were particularly active, and in the feverish efforts to push forward the work of settlement a tremendous amount of damage was done. It was under this *régimé* that the famous Dorrigo forest, one of the finest tracts of timber in Australia, went up in smoke. It was with mixed feelings that those who had the preservation of the forests at heart watched such happenings. They were regarded largely in the light of obstructionists, who were seeking to retard the progress of settlement. As time went on, however, public opinion veered round, and so strong did the agitation in favour of putting a stop to the destruction become, that the Royal Commission, previously referred to, was appointed. Following upon its report the Government decided to introduce the long deferred Forestry Act, but in spite of the state of affairs disclosed by the Commission's enquiry the measure was allowed to be revised and mutilated by the opponents of forestry, so that when it emerged from Parliament it was of but little value. For eight years it remained in operation, until in 1916, when the present measure was placed on the Statute Book. Certain anomalies in the Act were rectified later by an Amending Bill. The outstanding feature of the measure was the creation of a Commission with powers to place the management of forests on a business footing. This embraced their systematic working with a view to the regeneration and growth of future crops, and the disposal of timber and other forest produce to the best advantage. Quite early in its operations the Commission met with strenuous opposition, but this was gradually overcome, and the report for the year ended June, 1921, refers to a highly successful year, both from a financial and progressive point of view.

A brief reference to the financial history of forestry in New South Wales during the past forty-four years will give an idea of the excellent work the Commission has accomplished. During the period 1877-89, the gross revenue was £163,575. The amount expended in administration exceeded this sum by £3,491, while not one penny was spent on forest works. Compare this with the period 1909-21, during which the revenue was £1,231,061; administration expenses £519,571, and the amount expended on forest works, £349,026. It was during the latter period that real progress in forest management was made. An estimate of the forest resources of the State during 1920 disclosed that the total area, including both Crown and private possessions of timber value, was about eleven million acres.

Special attention has been paid to the cultivation of soft-woods, of which there is a great dearth. The initial operations provided for the planting of ten different areas; and these, coupled with the areas already taken in hand, amounted to over sixty thousand acres.



Kiwarrak State Forest Improvement. General view, showing regeneration.

An indication of the thoroughness with which the work has been undertaken is provided by the establishment of a training school for forestry students. This is situated at the Strickland State Forest in the parish of Gosford, and from its very inception it was evident that the enterprise would be well worth while. As time goes on and the students who are trained therein take over the control of our forest resources, we will be able to realise the great debt this State owes to those whose forethought and enterprise conceived and carried out the idea.

In this, as in other countries, one of the greatest enemies of forest preservation is forest fires. In America the problem of combating this destructive force was, to a great extent, solved a few years ago by the inauguration of an aerial patrol force which communicated, by wireless, the location and extent of the outbreak to one of the many stations situated throughout the forest area.

Unfortunately, Australia has no forests so extensive as to necessitate an aerial observation corps to detect fires, but nevertheless her forests have frequently been devastated as the result of a carelessly, and sometimes deliberately, dropped lighted match. The protective measures taken have, however, helped to greatly minimise the amount of damage which would otherwise have taken place, and the propaganda undertaken by the Commission in the direction of impressing upon settlers their moral obligation to protect the timber resources of the State has helped, to a most gratifying extent, in preserving a possession which we are only now beginning to assess at its true value.

ITEMS OF INTEREST

Naval Appointment.

Rear-Admiral Sir Allan F. Everett, K.C.M.G., K.C.V.O., C.B., who has been appointed successor to Sir Percy Grant, as First Naval Member of the Australian Navy Board, is fifty-three years of age. He has had an interesting career, and has crowded many adventurous episodes into the years that he has been connected with naval life. He was appointed C.B. in 1914 and created a K.C.M.G. in 1919. His decorations include those of Commander of the Legion of Honour, the Japanese Order of the Rising Sun, the Italian Order of St. Maurice and St. Lazarus, and the Russian Order of St. Stanislaus. There is general satisfaction in naval circles at the appointment, which is considered an ideal one.

* * *

New Island Service.

The inauguration of a new Island service conducted by the Burns, Philp steamer *Mataram* between Sydney, New Guinea and the tropical islands north of Australia, is destined to become highly popular. The islands mentioned have always possessed a strange fascination for the tourist, and to journey thither in the spacious, airy and comfortably arranged accommodation provided in the *Mataram* is to be assured of a delightful tour.

* * *

Efficiency.

British business methods are reported to be making gratifying improvements in the Peruvian Postal and Telegraphic Services, says *The Electrician.* Delays of from two to three days in the delivery of international telegrams were common, until on May Day Sir William Slingo, acting for the Marconi Company, took over these departments from the State. So great has been the change that, on three successive days before the last mail left Lima, not a single telegram was left undelivered overnight in any part of the Republic, and the staff are being given strictly eight-hour duties.

Tallowwood ("E. microcorys"), Casino district.

ON A FIJIAN COCOANUT PLANTATION

BY
RALPH STOCK

I AWOKE to the staccato call of the lali (Fijian drum), and through the mosquito curtains of my mat-strewn bed and the square of open window, looked out on a world of moon-bathed cocoa-palms.

The gentle rustling of their leaves had lulled me to sleep the previous night, and now, at four o'clock in the morning, when by all the laws of a well-regulated "lsland" household I should have been on my way to the shower, I was again succumbing to their influence. The boss's voice saved the situation.

The lali's chant had ceased, and as though a curtain had been rung up on the day's proceedings, the homestead was already astir. Dogs—five of them, and three fluffy puppies—barked; cocks crew; the tinkle of pot and pan sounded faintly from the coolie "lines"; Fijian house boys wandered hither and thither in their own leisurely way; blue wood smoke curled upward and hovered among the palm tops; someone in the overseers' quarters across the compound "wondered who was kissing her now" in light baritone—albeit an unusual conjecture at four o'clock in the morning—while over all this desecration of her peace the moon still spread her silver mantle.

"It's sheer cruelty to animals," observed the boss, sympathetically watching my stifled yawns over his teacup, "but you brought it on yourself by asking for 'a day' on this estate; our day starts at four o'clock in the morning, and ends when the labour gets through its task of two hundredweight two quarters of copra per man. We find we get more and better work done between daylight and nine o'clock a.m. than the whole of the rest of the day. You've finished? Good, but the shave will still have to wait, or you'll miss the start."

Over the sea the sky was just brightening as we mounted and rode towards the "lines," a long row of ugly but clean wooden rooms, whose doors opened on another parallel line of ugly but clean kitchens. The "labour" was streaming out to work, a motley gathering of thin-shanked, narrow-chested Indians whose faces seemed to reflect every shade of human expression. Here were the sullen, the cunning, the murderous, the fawning, the banal; and it struck me then, as it often has since, what insight, tact and courage must be necessary to successfully manage such a crew, culled from the dregs of Central India.

I said as much to the boss.

"There's only one way," he answered, "strict impartiality; a fair deal to every man until he turns dog, and then—well, if we had to run things exactly on Government ordinance lines, we might as well shut up shop. What do I mean by that? I mean the stick. Oh, yes, we lick 'em; they know that if they do their task set down for them by a grand-motherly Government, everything will go smoothly, and if they don't they'll get a licking that isn't grandmotherly.

"The average coolie translates kindness into weakness, and with native cunning takes advantage of it. You see those tickets hanging around each man's neck; well, they supply the case in point. One of my overseers has seen fit to trust a coolie's word. Three times one of his gang has deserted and lived in hiding on the fat of the island—prawns, shell fish, bread fruit, bananas and cocoanuts—and three times this overseer has let him off after exacting a promise that the offence would not be repeated. Needless to say, the man has disappeared again, and ten Fijians are now scouring the island for him. These tickets are a kind of passport for the rest in case one of them is grabbed by mistake. I had to pay sixteen pounds to the Government immigration department for the introduction of that deserter, not to mention extras and a five-pound reward for his capture, and unless he's run to earth and made to work out his indenture I might as well have thrown the money in the gutter. Gaol's not a particle of good; they revel in it—come back rolling fat, and advise the others to go there if they want a really soft thing. What are we to do? Coming from a labourers' paradise like Australia, you may think us harsh, but we shall have to chain that man to his work. I should like some of your 'Wowsers' to come over here and oversee coolie labour for a few months—

"The islanders? Oh, they don't have to work. The Fijian is an aristocrat, a property owner, and probably worth a good many more shekels than you and I. A few Solomon Islanders get into the collar, and splendid workers they are, but one has to handle them in a very different way to the coolie. They have a sense, and a high sense, of honour; with them caustic ridicule takes the place of the stick. If you find a Solomon Islander slacking, you laugh pityingly at his incompetency, say that you had taken him for a man fitted to do a man's work in the world, but since you find him to be a woman—or a fair imitation of one—why—and he'll buckle to in a perfect frenzy of offended dignity."

We were now fairly on the beach road, a sea of inconceivable colours stretching away to the white line of the barrier reef, dotted on our right, with punts awaiting their load of copra, while endless vistas of cocoanut palms, planted in uniform rows, stretched up the hillside to our left. Here and there a column of smoke marked the spot where copra-cutters were scooping out the kernels of the fallen nuts they had collected, and burning the husks to form potash fertiliser.

Among the palms, cattle were grazing on the short, green grass, that carpeted the earth with a natural velvet pile, happily unconscious of their dual service in growing into beef and keeping down weeds that would otherwise hide the fallen nuts.

An overseer cantered towards us, a splash of vivid white against the restful shade of the cocoanut groves. He had to report that the missing coolie had been run to earth in a cave on the opposite side of the island, and even as we listened to further details Fijian whoops of triumph floated down to us from the hillside. We waited, and presently a quaint procession evolved itself from the maze of palm trunks, and came to a halt on the beach road. Ten Fijians, armed with sticks and weeding knives, their already copper-coloured visages daubed with charcoal, to indicate that they really were terrible persons out for blood, squatted on their hams in a grisly semi-circle about an emaciated coolie, who lay huddled on the ground, protesting, with clasped hands, puckered forehead and wildly staring eyes that the boss was his father, mother, brother and sister, and might do with him as he willed.

To a disinterested spectator the scene was painfully abject, but the boss's not unkindly mouth was set in a firm, straight line.

"Chain him to the flagstaff in the compound," he said shortly; then, turning to me, "How about some breakfast?"

There are four meals on a plantation in Fiji—"cup of tea," "breakfast," "afternoon tea," and "dinner"—the first usually partaken of in pyjamas, and the last in evening dress. It was during the third of these that the copra punts crept down the coast, poled by naked and shouting coolies, to be beached opposite the drying yard. Here followed a procession of thin, staggering legs, under impossible looking loads as the bags were carried ashore, weighed and emptied on to the "vatas" or drying tables, where, in the course of a few days, the sun transforms the snow-white cocoanut kernel into the soiled, oily and evil-smelling commodity so eagerly sought after.

To-day was pay and ration day, it appeared, and the last copra sack had hardly been weighed and emptied than the little store, which forms such an important adjunct to every plantation homestead, was beseiged by chattering, gesticulating coolies. A word from the overseer, behind the counter, and the clamour subsided into awed silence.

"Bipat!"

A long, lean coolie, with a hare-lip and an air of profound melancholy, stepped forward to receive his week's wage—one shilling per day, minus fourpence per day for rations. I was assured that to the coolie this was dazzling wealth, but I failed to discern a suggestion of it in this man's expression. His rations were then served out with painstaking exactitude by a Fijian assistant:

Rice or flour, or rice and flour ..	22 oz.
Dal (lentils)	4 oz.
Ghi (butter made of rancid buffalo's milk)	1 oz.
Curry powder	⅓ oz.
Sugar (unrefined)	2 oz.
Salt	1 oz.

—the main ingredients of which are imported from India.

He had turned to go, when an idea seemed to strike him, that had the surprising effect of imbuing his mask-like countenance with some animation. A long altercation ensued with the Fijian assistant, ending in the purchase of several yards of the calico with which Indian women swathe themselves. The mystery was expounded to me by the overseer. It appears that the immigration regulations for Fiji allow only one woman to every three men, and that competition among the latter is brisk in consequence. The plantation owner sometimes utilises this deficiency as a spur to industry by apportioning the woman to the man who does the biggest task, and our friend Bipat had on this occasion earned a wife for the ensuing week; hence the brightened countenance and the calico.

The adage of Cherchez la femme applies with as much aptness to the trials and joys of the coolie in Fiji as to those of the rest of mankind; in fact, it is safe to say that 90 per cent .of his crimes are traceable to this world-old incentive to virtue and vice.

Rations had been served and wages paid, when a coolie who could almost be termed fat detached himself from the line that was streaming out into the compound, and advanced to the counter with a captivating smile. He pointed to his left foot, and danced upon it with every indication of enjoyment, while the overseer regarded him with the set frown peculiar to his kind. The coolie talked, and continued to talk, interlarding his remarks with dramatic gestures, until the overseer terminated the interview with the one word, "jhou."

"Which being interpreted?" I suggested, meekly.

"Means that I have worked a miracle," explained the overseer with becoming modesty. "It was raining yesterday morning, and coolies don't like rain. This man said he had a 'broken foot,' and I cured it in one night. How? By plastering his stomach with mustard."

There was a meke (Fijian dance) that night on the wide verandah facing the sea. We sprawled at ease in planters' chairs, while a tropical moon made day of night, and the Fijian manhunters celebrated the day's achievement, and reviewed their warlike past in song and dance.

Crescent Head, Macleay River, N.S.W.

A Speedy Freighter.

THE British steamer *Armagh* is credited with being the fastest freighter afloat. On a recent voyage from New York to Australia she averaged fifteen knots, which compares very favourably with the speed of many mail liners. On the run from Sydney to Melbourne the *Armagh* attained a speed as high as seventeen knots, and the master is hopeful of accomplishing the present voyage from Melbourne to Dunkirk in thirty-four days, and thus establish a new record for a freighter between the two ports. The *Armagh* has geared turbine engines, and was originally intended for a passenger liner, but on being reconditioned after service as a troopship her passenger fittings were not reinstated.

* * *

Interstate Trade.

The well-known passenger steamer *Kanowna,* which has been running on the E. & A. service to the East for some time, has again been placed in the interstate trade. Her place on the Eastern run has been taken by the *Arafura,* in command of Captain Pilcher.

* * *

A Growing Fleet of Steamers.

Eighteen months ago the Canadian Government merchant marine placed four steamers in the Australian and New Zealand trade, operating from both the Pacific and Atlantic coasts. The number has now grown to fourteen, and from recent advices received it is probable that one or two more steamers will be added in the near future. The vessels are all up-to-date, the tonnage of each ranging from eight to nine thousand tons.

Trial Trip of "Eudunda."

The trial trip of the Commonwealth steamer *Eudunda,* the twelfth vessel of the line to be built in Australia, was made from Williamstown yards recently. The steamer, which is of 6,100 tons, was built at Cockatoo Island and engined by Thompson & Co., of Castlemaine. She is the sixth vessel of the "E" class to be completed.

* * *

Medical Attention for Seamen.

Under Section 123 of the Navigation Act, which came into operation on the 1st instant, provision has been made for the appointment of qualified medical practitioners to be medical inspectors of seamen at the different ports. The duties will in all probability be carried out by the quarantine officers at the principal ports, the function being to examine seamen left behind from their ships on account of sickness or injury. Under the Navigation Act these men are entitled to medical attendance, medicine and other necessaries at the expense of the shipowner, in addition to wages at full rates for specified periods. Upon the medical inspectors will devolve the responsibility of certifying when they are again fit for duty.

* * *

Need for Improved Life-Boats.

Captain S. J. E. Jorgensen, who had the unique experience many years ago of voyaging from England to Australia in a lifeboat, is strongly of the opinion that a non-capsizable type of life-boat, fitted with certain other specified improvements, is essential if loss of life is to be reduced to a minimum in case of shipwreck. In an ad-

dress before the Marine Board of Victoria recently, Captain Jorgensen, who has had fifty years' sea experience, contended that life-boats, as at present constructed, have frequently proved to be unseaworthy in a storm. From his own experience he was satisfied that a life-boat could carry sufficient oil to keep the boat reasonably safe for a period of twenty-four to thirty-six hours until assistance, summoned by wireless, arrived. Captain Jorgensen outlined the structural features required to attain the degree of seaworthiness mentioned, and expressed his willingness, if the necessary financial, scientific and engineering assistance were provided, to construct a boat that would embody all the features necessary to afford the maximum of safety in heavy seas.

* * *

Training for the Mercantile Marine.

The Ancient Mariners' League of New South Wales is anxious to see a scheme of training officers for the mercantile marine fostered by the Government. The League contends that every boy trained for the merchant service is a national asset, and it is proposed to ask the Government to procure a sailing vessel on which forty or fifty boys could be trained while the ship was trading in the ordinary way.

The Pangbourne (N.Z.) Nautical College has a scheme in operation, and on the New Zealand Shipping Company's 10,000-ton steamer *Devon* there are at present twenty boys, all under the age of eighteen, who are undergoing a course of training designed to thoroughly equip them for service at sea. The Pangbourne course is a comprehensive one, and provides for the schooling of the boys as well as instruction in seamanship.

* * *

Strange Floating Dock.

It is questionable if amongst the many uses to which the hulks of ships have been put at different times, anything more unique than the service which the old wooden ship *Habitant* is fulfilling, has yet been devised.

The vessel arrived in Melbourne in 1894 from the United States with a cargo of oil. She caught fire shortly after her cargo was discharged, and the skipper had to perform an heroic act to rescue his wife and children before the vessel was burned to the water's edge. There was a strong wind blowing at the time of the fire, and in order to prevent the ship's moorings being burnt and so allowing her to drift amongst other vessels, the officials of the Fire Brigade bored two holes through the bow of the *Habitant,* allowing the chain lockers and forward portion of the ship to become filled with water. This kept the moorings intact and prevented the fire spreading to other vessels.

When the hull of the *Habitant* was sold it realised £190, the purchasers being the Melbourne Steamship Co. They converted the vessel into a floating dock; the work being carried out under the supervision of Mr. John Clark, of Williamstown—the great shipbuilding authority of that time. Since then no fewer than 1,209 vessels have been docked in the hull of the *Habitant,* the timbers of which are still sound enough to withstand many more years' service.

* * *

Sydney's Modern Wharves.

Few people, other than those whose business takes them into the vicinity, have any idea of the tremendous undertaking involved in building a modern wharf such as is now being erected by the Harbour Trust Commissioners at Dawes Point. The building of this particular structure has been particularly difficult owing to the great depth of water met with as the piles extended outwards. At a distance of one hundred and fifty feet from the shore a depth of one hundred feet was reached, while three hundred feet out it was found necessary to splice two piles, each about seventy feet long, to strike a firm foundation. Turpentine piles, cut on the north coast of New South Wales, have been used exclusively, experience having proved that this timber is best suited to withstand the attacks of water pests in the shape of *cobra* and *linoria.* Each of the long piles cost from £40 to £50, and it took on an average one thousand five hundred blows from a two and one-half ton "monkey" to drive them into position. The wharf, when completed, will measure six hundred feet long by one hundred and thirty feet wide. It will have a double deck shed, so constructed as to render lifting unnecessary when drays and lorries are being loaded.

"Demosthenes" in Heavy Weather.

Exceptionally heavy weather was experienced by the Aberdeen liner *Demosthenes* a couple of days out from Albany on her last voyage from London to Australia. Portion of her steering gear was damaged by the heavy seas, and the liner was delayed several days at Albany while repairs were being effected.

* * *

Ships for Norfolk Island.

Lieutenant-General J. W. Parnell, C.M.G., O.B.E., Administrator of Norfolk Island, sees a bright future before the island if only better shipping facilities are made available. The fishing industry is capable of tremendous development, but like most of the other activities of the place it is hampered because of the impossibility of reaching outside markets. One great natural drawback of the island is the absence of a harbour, and as the present cost of constructing one is out of the question this defect is not likely to be overcome for some considerable time.

* * *

New P. & O. Liners.

The building programme of the P. & O. Steamship Company provides for the construction of four modern liners to replace those sunk during the war.

The largest of the new liners—the *Mooltan* and *Maloja,* will each have a registered gross tonnage of 20,700, while the remaining two, the *Mongolia* and *Moldavia,* will each be of 15,800 tons register. The two former vessels will enjoy the distinction of being the largest and most palatial steamers engaged in the Australian overseas passenger and cargo services.

* * *

Typhoon Strikes "Aki Maru."

Passengers on the Japanese mail steamer *Aki Maru,* had a thrilling experience when the vessel was between Nagasaki and Hong Kong on her voyage to Australia last month. A typhoon, arising with the suddenness for which such disturbances are noted, struck the vessel, and for two days the passengers were kept below while the steamer was deluged by mountainous seas. At times the vessel was unable to make more than four knots an hour. The whole ship's company had an anxious time while the fury of the storm lasted, but the vessel behaved splendidly throughout, and came through the ordeal none the worse for the buffeting she received.

No P. & O. Steamers for Hobart.

It has been announced that the P. & O. Company's steamers will not call at Hobart for fruit loading next season. The Navigation Act prohibits oversea liners from carrying interstate passengers, and the P. & O. Company considers that the loss of such revenue is sufficiently serious to justify them in cutting out Hobart as a port of call in future.

* * *

Cruise of British Trade Ship.

The cruise of the special ship to be built by the company formed under the title of British Tradeship Ltd., will commence next year. A round-the-world tour, extending over eighteen months, has been planned during which South America, South Africa, Australia, China and India are to be visited. The vessel is to be of twenty thousand tons burden, and will be named *British Industry.* She will be specially fitted with eight decks and will contain banking, insurance and interpreter's offices. There will also be a reception hall in which manufacturing processes will be shown by moving pictures. The company directors are the Duke of Northumberland, Earl Grey, Mr. J. W. Beaumont Pease (deputy chairman of Lloyd's Bank), and Swan, Hunter & Wigham Richardson Ltd. (the well-known shipbuilders).

* * *

Smart Rescue Work on "Orsova."

The last voyage of the Orient liner *Orsova* was marked by a smart piece of rescue work while the vessel was in the Mediterranean. It was about midnight when the officer on watch, who was attempting to peer through the heavy fog which enveloped the vessel, was startled by loud cries coming from over the ship's side. The "man overboard" signal was promptly blown, and in an instant the liner's engines were reversed. Life-buoys, with flares attached, were thrown overboard in the hope that the drowning man might be able to grasp one. In the meantime a life-boat in charge of the fourth officer was launched, and guided by the man's screams he was soon located clinging to one of the buoys, and taken on board. The whole manœuvre was executed so quickly that the passenger was under the doctor's care on board the liner twelve minutes after the first alarm was given.

Veteran Tug-Master Retires.

After a service of fifty-five years with the Melbourne Steamship Co., during thirty-two of which he has been master of the ocean-going tug *Racer,* Captain Daniel Fearon has just retired. As might be expected, Captain Fearon holds the long-service record in Port Phillip. His first connection with the Melbourne S.S. Co. was as a deck-hand on the tug *Black Eagle,* the only steam-propelled vessel owned by the company at that time. One of the most exciting incidents in which Captain Fearon took part was in 1891, when the *Craigeburn* was driven ashore on the Black Beach at Sorrento and six lives lost. Captain Fearon was in charge of the *Racer* at the time, and in proceeding to the rescue narrowly escaped meeting with disaster. A fierce south-westerly gale was blowing at the time, and in negotiating to get sufficiently close to the *Craigeburn* to cast a rope on board, the steering gear of the *Racer* became seriously disarranged, and for six hours she was buffetted by the heavy seas; while her crew, knee deep in water, attempted to effect repairs. They ultimately succeeded, but in the meantime the *Craigeburn* had been driven to her doom. It stands to Captain Fearon's credit that his long association with shipping is untarnished by any serious mishap.

* * *

Decline in Shipbuilding.

Lloyd's shipbuilding returns for the quarter ended June 30, 1921, show a serious depression in the trade. The depression referred to in the previous return has been accentuated by cancellations and suspensions amounting to one hundred and seventy-nine thousand tons, or approximately one third of the aggregate tonnage on the stocks in Great Britain. The greatest decline has been in the amount of constructional work begun—the aggregate being only sixty-eight thousand nine hundred and twenty-eight tons. This is probably the lowest return of the kind on record in Great Britain.

* * *

Twenty-one Hours in the Water.

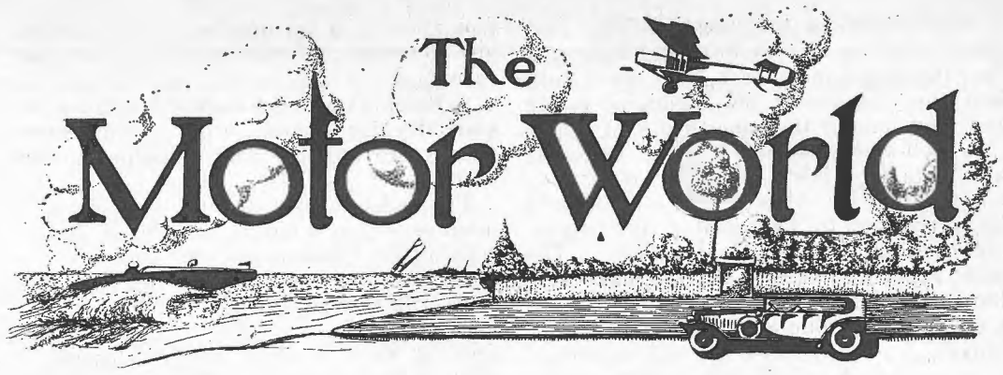
The foundering of the cutter *Moth,* which was lost in a heavy south-easterly gale between Darnley and Steven's Island, Torres Strait, at the end of August, was responsible for the loss of two lives. The vessel refused to answer her helm and was swamped by an extra heavy sea. Two of the survivors managed to reach Steven's Island after being twenty-one hours in the water. It was a remarkable feat of endurance, particularly in view of the severe weather to which the unfortunate men were exposed.

* * *

Burned at Sea.

The captain of the *Cecilia Sudden,* which was burned at sea off the Great Barrier recently, has told a graphic story of his experiences. Smoke was first noticed issuing from the hatch just before nightfall, and although desperate efforts were made to extinguish it the heat gradually became so intense as to convince those on board that the ship was doomed. A trawler was observed in the distance, and owing to the signalling apparatus being cut off by the fire the only means of attracting her attention was to hoist a blanket, and allow dense volumes of smoke to escape by opening one of the hatches. As the trawler approached the captain and crew of the *Cecilia Sudden* took to one of the life-boats, which, unfortunately for its occupants, was not provided with rowlocks. The boat was taken in tow by the trawler, which then made for the burning ship and attempted to take her in tow. Failing to accomplish this, and the crew in the life-boat fearing that their already badly leaking boat would be sunk by the trawler's propellor, it was decided to cut adrift from her. The trawler then made off towards Cape Colville, leaving two of her crew on board the *Cecilia Sudden.* They were afterwards taken off by the life-boat which was run alongside the burning vessel to ascertain if it were possible to drop her anchor. Owing to the chain being jammed the attempt was abandoned, and the waterlogged life-boat was paddled towards the Great Barrier. Shortly afterwards the trawler's life-boat, which had been sent in search of the two men left on the burning vessel, was met with, and abandoning their leaking boat the occupants were taken on board, and later on reached the trawler.

The captain of the *Cecilia Sudden,* whilst disclaiming any superstitious fancies, admitted that his vessel was regarded by old mariners on the Pacific Slope as possessing a "hoodoo." It was strange that only quite recently a member of the crew caught and killed an albatross.



BY

"WILGA"

Light Cars and Contests.

CURIOSITY is often expressed at the absence from reliability, hill-climbing and petrol consumption trials of light cars. The main reason is that, owing to their light weight they cannot "coast" to advantage. The epicyclic gear only allows coasting on the steeper gradients, and when it comes to hill-climbing all two-speed cars are out of it. In fact, only four-speed gear-box cars will have any hope in future contests under the existing formula. Hitherto American cars have enjoyed winning contests mainly on account of the absence of European competitors.

Most European cars are fairly high-geared "on top," consequently the engine revolutions are comparatively slow on the level and on slight slopes. Also they have a very even gradient of gears, per medium of the four-speed gear-box; and this must necessarily be a great advantage. No American manufacturer so far supplies a four-speed gear-box, and as the American cars are relatively low-geared "on high," the European cars should have an absolute monopoly in trials.

Generally speaking, another advantage possessed by European cars is their greater weight in proportion to horse-power, and this must materially assist them in gaining points, as their poundage in relation to horse-power considerably overcomes the resistance of air pressure. Assuming, of course, that points are compiled on the formula adopted by automobile clubs.

Mr. S. F. Edge, of *Napier* fame, many years ago, explained to the Royal Automobile Club of Great Britain what wind resistance meant to a travelling car; and his own tests at Brooklands, under official observation proved that such resistance should be considered in relation to the area presented by the car when in motion. For example, comparing automobile club trials, a ten horse-power car need only average fifteen miles per hour in trials, whilst a twenty-five horse-power machine has to average over twenty-one miles. The consequent increased wind resistance counts considerably in favour of the light-powered cars. Of course, if the high-powered car were of no additional weight, things would be equalised. We know that many a light-powered car is just as speedy as high-powered makes, by reason of the reduction of weight.

Steamship managements and railway authorities have frequently emphasised that even a slight acceleration of speed results in a great increase in cost of operation. As proof, if proof were needed, the railway commissioners of this State some little time ago slowed down the speed of the Melbourne Express by thirty-five minutes between Sydney and Albury, and the Brisbane Express by an hour and a half between Sydney and Wallangarra. Some other fast trains were similarly treated, the reason given being that cost of running must be cut down and stocks conserved.

It will be seen, then, that certain light-weight cars have enormous wind resistance to overcome in proportion to weight, the power required to drive against the force of the wind being considerable in percentage compared with that necessary to drive the weight of the car itself.

When it comes to "coasting" the machine weighing fifteen cwt. and having a four-feet eight-inch track, will coast only half the distance of one weighing thirty cwt. and having the same width of track.

A well-known make of car of considerable note in trials coasted the other day no less than six miles out of the fourteen from Sydney to Parramatta, the engine not turning over for that distance. The same experimenter took a light make over the same route and was only able to coast a quarter of a mile and that on Tavener's Hill!

* * *

What are Reliability Trials?

When motor reliability contestants pass through a village in New South Wales, they are frequently "cheered up" by residents with the assurance that there are so many cars so many minutes (or hours) ahead. The idea that a race is not in progress seems ineradicable.

The Sydney daily press, one would think, should be able to find one of its staff with sufficient knowledge to avoid the error of the isolated countryman. Yet two of them speak of the recent interstate "reliability race"(!), and say that one car won in fastest time for the journey!

Reliability is the ability to reach the appointed "control" station for the night without breakages or engine stops, and within the time scheduled, minute of arrival being different (as is also time of departure) for each car. Thus the lowest powered machine is set down to lead off; the most powerful to start last. Incidental to these trials one or more hill-climbs are conducted. Speed, of course, tells here. Petrol consumption is also a factor in these events.

Reliability trials have been conducted by the R.A.C.A. (Sydney) since 1905, excluding the war period. Last month the first similar contest of any magnitude in South Africa was held. It extended over three days (453 miles) and there were thirty competitors. *The Latest* (Durban) states that the roads were vile; that "many makes of English and American cars were totally unrepresented, due, no doubt, to the fact that their agents were sitting on the wall to see what sort of an event it would turn out to be before entering their cars"; and "some of our good friends, the reporters—who are very annoyingly simple when it comes to motor technics—took the wrong turning, as did the public, and referred to the event as 'a great race'."

A *Buick,* carrying a load of five thousand and fifty-five pounds, won. It averaged twenty-two and one-half miles per gallon of petrol.

The R.A.C.A. has decided to fix a maximum as well as a minimum speed in future reliability contests, as was ordained in some previous competitions, and in this way will the more quickly educate the general public—and others—as to the object of these trials. The conditions in every instance set out that the principle underlying the rules governing the competition is that the trial is one of reliability and not speed. Yet the public wont see it, somehow.

* * *

"Bosch" Magneto.

There are signs that the German magneto will be found in the United Kingdom in large numbers unless the British Government takes drastic steps to prevent it. Germany, before the war, held a monopoly in magnetos, and if it is re-established it will mean the end of the industry which in Great Britain came into existence solely on account of such war. Its childhood has been spent under entirely artificial conditions. It is not yet strong enough to fight foreign price-cutting and dumping. Some of the newspapers advocate that the Australian example of prohibiting the entry of German goods should be adopted in England in respect to what is considered a "key" industry. (Had it not been for the rapidly formed and fostered British magneto industry the war would have been lost to the Allies. Therefore it is a true "key".)

The British magneto is the finest instrument of its kind in the world, especially from a technical point of view. It gives a very hot spark at very low speeds. A small one may be used on the largest engines; the German may not. Large German makes are required for large engines. A British motor cycle magneto has been successfully employed for the ignition of a three hundred horse-power aero engine!

But if the German magneto gets into England under a disguise, as it does in Australia, where is the use of the prohibition? A Sydney importer of cars and accessories showed this writer five *Bosch* magnetos which were landed in Australia some while ago. The name was stamped upon each one. Of course, the Customs authorities did not let them through. But we "viewed" them and stuck a private mark on them on general principles. They were sent back to the reputed country of origin (America), and were duly returned with precisely the same numbers, with the private marks—but with a new name! It was just what we suspected and expected.

Was it not possible to find a man in Sydney who could have done the job—filing off the old name and stamping on the new —without expense and loss of time?

And in Sydney before these happenings, but during the war, a firm advertised magnetos under that new name with the piquant addition, "The original *Bosch!*" Would England stand it?

* * *

Nemesis at Maitland.

A month or so ago the writer visited West Maitland, and was struck with the free and easy way the recently-started motor 'bus traffic to and from East Maitland was carried out—or partly carried out. The 'buses left terminii at any old time; if empty at a distance from their supposed objective they would be turned back, leaving lamentations at the terminus. Worse still, the over-crowding at certain periods of the day was shameful. The steam tram did none of these things.

"The worm has turned"; the golden goose is killed. At a public meeting of citizens, fears were expressed that the trams would be so seriously affected that the service would be withdrawn. The tram time-table was being "spoofed." So it was decided to patronise the trams solely and the council said "no more 'bus licenses."

* * *

Wanted, a Causeway.

Paddy's River is on the main southern road to Goulburn, and is one hundred and five miles from Sydney. Some time ago the bridge spanning it was burnt down. Since that event, the crossing has been a terrible thorn in the flesh to motorists and other road users.

It is the opinion of motorists that this ford should be made crossable, not by another bridge, but by a concrete causeway with monier pipes below to carry away the water from its natural reservoir in a southerly direction. It is estimated that the cost would not be prohibitive, various sums from £250 to £450 being mentioned.

The problem of providing effective causeways at several points between Mudgee and Cassilis has been effectively solved, and there is no reason to doubt that Paddy's River will succumb if properly approached.

* * *

The Tyre Thief.

Now is the harvest for the tyre thief. Prices having dropped and the touring season opening, car owners are equipping spare rims with tyres. In some instances two spares are being carried.

As soon as you purchase a spare, whip it into work, even if only for a brief period. Carry only spares that have been used.

Why?

Because, according to a gentleman well known in the trade, investigation has led to the remarkable fact that nearly ninety-nine per cent of all tyres stolen were brand new, the approximate one per cent. remaining being used tyres in cases where, evidently, the thief did not stop to see what kind of tyre the case contained. The peculiarity is said to extend to case-covered goods only.

* * *

Ideal Trip for Eight-Hour Holidays.

Enter Mr. W. M. Jacombs, a well-known accountant of Sydney, and a prominent member of the Royal Automobile Club of Australia.

He speaks of a trip which he took in a *Baby Fiat,* driving Mrs. Jacombs and "six of the best."

The itinerary should fit in well for Saturday, Sunday and Monday (Eight-Hour Day) or any other two or two and one-half days of the year. Mr. Jacombs had not the slightest trouble with engine or tyres, and Macquarie Pass is no skating rink!

The trip embraces the beauteous Bulli Pass, Look-out and Sublime Point, Fitzroy Fall, Moss Vale district and the "Gib."

Viâ Tom Ugly's (twelve miles), then to Waterfall (twenty-six miles) and to the top of Bulli Pass (forty-one miles). Sublime Point is at the thirty-nine-mile, one hundred yards to the right off the main road. (By striking to the left at the thirty-one-mile and going down Bald Hill

and through Stanwell Park, some grand sea-scapes open out. By, at Thirroul, running up Bulli Pass, two and one-half miles, you will be rewarded.)

Wollongong is ten miles from the Pass, fifty-one miles from Sydney. Albion Park is sixty-six miles from Sydney. At either stop a good afternoon's run has been accomplished.

Up Macquarie Pass next morning, unspoilt splendours will unfold themselves. Robertson is fifteen miles up, the first four miles undulating and good, the next mile poor, then steep grades to two thousand two hundred feet, with short turns. Enquire at Robertson and visit Belmore Falls and Fitzroy Falls (twelve miles altogether) then Yarrunga, Moss Vale, Bowral or Mittagong will welcome you. Or go from Robertson through Kangaloon to Bowral, missing Moss Vale (about sixteen miles as against about twenty-seven).

A quiet seventy to eighty miles run home next day and you will realise what fools those are who "scorch" through the whole trip in a day. The road is generally good; the worst patches are near Liverpool (being reconstructed).

* * *

Motor Yacht Club of New South Wales.

The Racing Committee of the Motor Yacht Club of New South Wales has appointed Rear-Commodore Copeland, Judge; Mr. McGriffiths, Starter and Time-keeper, and Mr. F. J. Harrison, Honorary Secretary.

The season opens on October 20. Fixtures so far practically decided upon are:

October 29: General handicap race for boats twelve miles per hour and under, over Club course, three laps (six miles); and a handicap for speed boats over Pile Light course (nine and one-half miles).

November 19: Race for speed pennant over Manly and Pile Light course.

December 10: Speed boats in Laurel Cup presented by Mr. G. S. Purssey, for boats of certified speed of twenty-five miles per hour and over.

January 7: General handicap for Stelling Shield.

* * *

Motorgrams.

The motor yacht *Miss America,* the cable advises, has established a new world's motor boat speed record by attaining eighty and one-half miles per hour. *Miss America,* just built, was expected by the makers to do "over sixty-five knots."

* * *

Mr. C. O. Sherwood, manager in New South Wales for the Dunlop Rubber Co., Ltd., who recently returned from a six months' trip to America and England, says that the miners' strike, by bringing many motor vehicles into operation, gave the drooping motor trade a material fillip, especially in motor *char-a-bancs.* These were running over seventy miles. Tarred roads are in great favour, and are regularly attended to. Motor 'buses (ninety-two thousand, including taxis), in England and Scotland, and ninety-thousand commercial vehicles are proving their worth in the United Kingdom.

* * *

The manager of Marcus Clark & Co., Ltd., agents for the *Chandler Six* and *Cleveland Six* cars, commenting upon the scoring, "as usual," of full reliability points (five hundred) in the recent interstate contest, said that there was no claim by the makers that the cars were "freaks," but the machines would land passengers at any point in Australia without effort and with the utmost dependability. Only five other cars of the total number—twenty-seven—came through without losing points in this important section.

* * *

A recent purchaser of a new *Essex* journeyed to Brisbane in one of the competing cars in the Brisbane to Sydney trial. The car was run to the laid-down schedule. "Not at all in my line; too strenuous," he said on arrival at the northern capital. "I am going back by train!" And he did.

* * *

It is reported from Picton (N.S.W.), that the local council intends, at an early date, to light the town by electricity. A contract for reconditioning the main roads near the municipal boundary of Mittagong has been completed. Generally, the main roads within the area are in good order, except one short length near Jarvisfield.

* * *

Blaxland Shire Council reports having carried out on the Great Western Road twenty-eight miles of repairs. Over six thousand lineal yards have been re-gravelled at a cost of £701. The main Jenolan Caves Road (Lett River to Hampton), four hundred yards constructed; balance re-gravelled and surface, cost £606.

The Prince's Highway within the Bega Council's area, is stated to be in very good order, the greater portion being metalled. The work is to be continued at a cost of another £300.

* * *

Mr. O. M. Parsons, manager in Melbourne for the Michelin Tyre Company, Ltd., says that business in Great Britain and Europe, whence he has just returned, is still very disorganised, but the worst seems to be over. A severe blow has been dealt motoring by the imposition of a tax of £1 per horse-power per year. This has brought about sales of increased numbers of low-powered cars.

* * *

The Automobile Association of South Australia will shortly confer with the National Roads Association, regarding uniform colour trails for the main roads of different States. Good progress is being made with the "Blue Trail" from Melbourne towards Albury and a start has been effected in Victoria on the "Red Trail" (Melbourne to Sydney, *viâ* Gippsland and the New South Wales South Coast route, now the Prince's Highway).

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Rolls-Royce, Ltd., announce that reductions in wages and the cost of materials have enabled them to reduce the price of their motor chassis from £2,100 to £1,850.

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When the Tyre Goes Flat.

When a tyre goes flat slowly, try pumping it, writes *The Motor Weekly* New York correspondent. Really, this advice is easy to follow if you have a good pump. There are several good reasons for pumping it first. The valve may be leaking. By testing the valve, and perhaps replacing it, the trouble may be remedied, and the trouble of a tyre change avoided. Assume, however, that the flat tyre is caused by a puncture or a slow leak in the tube. Assume further that the driver objects to changing the tyre himself and wishes to run to a garage to have this work done, but that he is afraid of running flat for fear of ruining the shoe. Under such circumstances it is often possible to pump the tyre and get to the garage before it goes flat again.

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Where the Oil Goes.

Just where, asks the New York correspondent of *The Motor Weekly,* does the engine oil go? Gasoline, to be sure, is burned in the cylinders, but what uses up the oil, making replenishment of the reservoir necessary so often? Oil consumption may be blamed mainly on the leakage of oil past the pistons into the cylinders, where it is consumed by the burning charges. Some leakage of oil past the pistons cannot be prevented; in fact, it is hardly fair to call it leakage. But if the engine is well made, if the pistons and rings are tight and the proper oil grooves are cut in the pistons, only a minimum of oil should be able to work its way past up into the combustion chamber, where it is burned along with the gasoline. High oil consumption usually indicates, therefore, leakage past the pistons, but not always. The oil level in the crankcase may be too high, or, speaking more generally, the amount of oil fed to the cylinder walls may be too great. Finally, it is obvious that a thin oil will get past the pistons with greater facility than a thick one. On the other hand, a thin oil is more likely to reach every surface when the fit is tight. Therefore, a medium oil is logical in a new engine, but a heavy oil is often to be preferred in an old one.

* * *

Racing Drivers.

There was one competitor in the Boulogne Grand Prix who drove like a demon, but who looked the last person on earth to be trusted at the wheel of a car, comments "Contact" in *The Motor.* A tall, loosely-built youth, he was, Reville by name, and when walking or sitting away from the car was continually on the move, a mass of twitching nerves and quivering limbs. I wonder if there is some form of mental exhilaration connected with speed on the road that soothes the nerves of people of this temperament, or is it because their superabundant energy is used up and forcibly diverted into definite channels by the necessity for quick reflex actions when travelling at speed? A friend tells me he has seen similar cases before.

Aviation in Australia

Study of Aviation.

THE Footscray (Vic.) Technical College has established a course in aeronautics for Australians desirous of taking up aviation as a profession. The British Air Ministry has co-operated with the College by sending out, free of cost, aircraft engines of various sizes and designs, propellors, wing sections, magnetos and spare parts; the whole constituting a very valuable equipment which will form most of the plant required to commence operations.

It is proposed to establish courses of a highly technical nature, but attention will also be paid to the fundamental principles underlying all engineering study, particularly those peculiar to the study of aerodynamics and aircraft construction. The Principal of the College, Mr. E. P. Eltham, A.M.I.E., is a keen student of the progress of aviation, and is confident that a great number of young Australian mechanics will welcome the opportunity of obtaining special knowledge of aircraft and aeroplane engines, which are admittedly the highest development of the internal combustion engine. The Australian Defence Department has undertaken to supply the College with diagrams and drawings for demonstration purposes. Civil aviation firms in Melbourne have welcomed the idea, and it is expected that their mechanics will be amongst the first students. The courses will consist of a full day diploma course covering three years' day tuition for designers and technical experts in aircraft, and a similar course for those who desire to gain certificates as skilled aircraft mechanics. Included in each course will be the testing of Australian timbers to determine their suitability for aircraft construction.

* * *

Scarcity of Pilots.

A probable drawback to aviation in Australia in the near future is the difficulty in obtaining skilled pilots. Many Australians became expert aviators during the war, but on returning to Australia there was no avenue for the utilisation of their services, hence they took up other vocations. It is practically impossible to induce these men to return to aviation owing to the fact that the majority of them are in good positions, and as the average time for turning out a competent pilot is about twelve months it appears that definite steps will have to be taken to immediately train the men required to undertake the services which it is hoped will be established in various parts of Australia in the near future. The training scheme initiated by the Footscray Technical College is not expected to yield results for at least three years.

* * *

Ross Smith Memorial.

The Acting Prime Minister, Sir Joseph Cook, informed a deputation from the Third Advertising Convention of Australia and New Zealand which waited upon him in Melbourne recently, that the Government intended to erect a memorial at Darwin to commemorate the historic flight of Sir Ross and Sir Keith Smith from England to Australia.

* * *

The Brennan Helicopter.

It has been reported by cable that tests of the helicopter, the "direct lift" 'plane invented by Louis Brennan, formerly of Melbourne, have so far been successful. Great secrecy is being observed regarding the machine, but an idea of the importance which is attached to it may be gauged from the fact that Frank Courtney, winner of the 1920 Air Derby, has been chosen as pilot for the first trial flight.

* * *

Flight by Melbourne Surgeon.

Sir Douglas Shields, the well-known surgeon, formerly of Melbourne, has had the unique experience while abroad of having flown from London to Paris to diagnose an illness which overtook Major Ottley while attending a sitting of the Supreme Council. The patient was conveyed back to London by aerial ambulance, and operated upon with the most favourable results. The happening is the more interesting by reason of the fact that the application of aerial transport for medical men has immense possibilities in Australia.

* * *

Romance of the Air.

An aerial flight by William Dick, aged 103, of St. Arnaud (Vic.), which was undertaken in February last in a *Sopwith Gnu* 'plane, piloted by Captain Roy King, has had rather a strange sequel. The news of the flight appeared in the papers in Scotland and excited the interest of the old gentleman's sister. The correspondence which followed revealed the relationship between the pair—a happening which neither expected, as Dick left Scotland in 1851 at which time his sister had not been born.

* * *

Australian Seaplanes Despatched.

The fleet of seaplanes intended to form part of Australia's defence force has been dismantled and shipped to Australia by the *Boonah,* which left London early last month. It is probable that an expert will accompany the 'planes to supervise the reassembling of same, as the efficiency of the machines might very easily be impaired through imperfect assembling.

* * *

Seaplanes for Mail Services.

The Department of Civil Aviation has received numerous inquiries as to whether the use of seaplanes or flying boats in addition to, or in lieu of, aeroplanes for the Sydney to Brisbane aerial service would be acceptable. Those interested have been advised by the Director of Civil Aviation that as the department recognises that the coastal service is well suited to the use of seaplanes or flying boats it is prepared to consider such proposals. It is emphasised that the principal towns to be served on this route are situated on rivers or estuaries thus ensuring safe landing places for marine types of aircraft.

* * *

Commercial Air Transport, Ltd.

In the September issue of *Sea, Land and Air,* it was announced that the Federal Government desired tenders from competent aircraft proprietories for the carriage of mails by air from Sydney to Brisbane and from Adelaide to Sydney. The terms of these contracts were fully advertised in the issue aforementioned. The stipulations are fairly drastic, but of course as aerial services are a new departure in the Commonwealth the Department is entitled to safeguard itself.

In Western Australia Major Norman Brearley, the pioneer of aircraft over there, who has flown over twenty thousand miles in the western State without mishap, has secured a big Government subsidy to carry mails over the twelve hundred miles of country between Geraldton and Derby.

During the past month a competitor has entered the field in Sydney. A most comprehensive prospectus has been issued under the title of Commercial Air Transport, Limited. It embodies an ambitious scheme with a capital of £150,000 in 150,000 shares at a pound, payable in instalments. At the back of the proposal, to which the Commonwealth Bank has added its blessing, are such well known names as Major-General Sir Charles Rosenthal, Commander Lambton, Mr. P. Stewart Dawson, Mr. R. H. Truman, F.C.I.A., Mr. J. S. Gibb, F.C.P.A., and Mr. E. A. Morris, A.I.C.A.

Time schedules have been mapped out with all due regard for the great distances to be negotiated on the inter-city routes and the shorter ones on the minor ranks which will be mostly air taxi. Commercial Air Transport proposes to link Broken Hill and Sydney, and Adelaide and Sydney in nine and one-half hours, with no penalties for "scorching." Likewise Sydney and Melbourne, and Sydney and Brisbane will be connected overhead in the blue dome in six and one-half hours—not flying hours in any instance, but actual hours for the journey. Fares work out at roughly thirty shillings an hour, which is a reasonable rate when the time saved along with the petty cash and other items are taken into consideration. At present mails and passengers to Broken Hill have to negotiate the railway systems of three States, the greater part of a week being consumed in the process, and much energy and patience wantonly exhausted.

Support should be extended any genuine proposition out to exploit Australia's azure skies in the interests of speedy connection. Over and over again it has been pointed out that the Commonwealth is an ideal aerial field. Its pure atmosphere, clear skies, flat topography, immense distances, slow moving trains, all combine to make aerial conquests of the most vital importance.

* * *

Aviation Out-Back.

Captain J. R. Fullarton, of the Shaw-Ross Aviation Company of Melbourne, who recently toured the Darling country in his *Sopwith Gnu*, put up some smart performances when travelling between different centres. The distance from Menindie to Broken Hill, seventy-five miles, was covered, with the aid of a strong following wind, in thirty minutes, and later the 'plane flew from Loxton to Murrayville, a distance of eighty miles, in forty minutes. The country out west is described as being favourable for flying. On one occasion Captain Fullarton brought his machine to earth in an empty street and taxied up to the door of the hotel.

* * *

Long Aerial Tour.

The *De Haviland* 'plane piloted by Lieutenant Briggs, which left Melbourne in the middle of August on a business tour of the principal Victorian towns in the interests of the Vacuum Oil Company, will, at the conclusion of the journey, have covered over three thousand seven hundred miles. At each town visited an officer of the Company, Mr. D. S. Aarons, who is accompanying Lieutenant Briggs, pushed the sale of the new *Plume* motor spirit. It is one of the probabilities of the future that commercial travellers, instead of long, weary journeys by train and car to reach the out-back towns, will swoop down from the clouds upon the landing place which will be provided adjacent to every populous centre.

* * *

Lieutenant Parer's 'Plane.

An idea of the damage frequently caused by thoughtless souvenir hunters is afforded by Lieutenant Parer's 'plane, which has suffered to the extent of £100 since the aviator left it standing near Gisborne; where his forced landing in the around-Australia flight was made. Sightseers have interfered with the machine, stripping the instruments from their positions and throwing them about. Pieces of the 'plane have also been carried off, and every possible point which could be written on has been scribbled over with the names of the aviator's admirers. Whilst in hospital Lieutenant Parer worked on the proofs of the book he has written regarding his famous flight (with Lieutenant McIntosh) from England to Australia. The book will be translated into Spanish, and editions will go to South America and the Philippines.

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Aerial Mail Charges.

The Postal Department has decided to fix a surcharge of 3d. per half-ounce on letters carried by the first aerial postal delivery, which will commence about the end of October between Geraldton and Derby (W.A.). It is Captain Brearley's intention to use one pilot and machine between Geraldton and Carnarvon, another from Carnarvon to Hedland, touching at Onslow, and a third from Hedland to Derby, touching at Broome. Passenger fares will be at the rate of one shilling a mile. The passenger side of the business is, of course, quite distinct from the mail contract; it being one of the terms of the agreement that any revenue derived from any source outside the subsidy paid by the Government shall belong solely to the contractor.

* * *

Aviation on the North Coast.

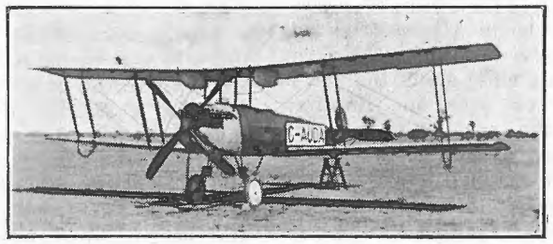
Intense interest has been aroused on the North Coast as a result of the Federal Government's determination to inaugurate an aerial mail service between Sydney and Brisbane. A number of the principal towns on the coastal rivers between the two capital cities, being in an almost direct line, will operate as links in the service, and local organisations are now bestirring themselves in an endeavour to locate the most suitable landing grounds. It is gratifying alike to the authorities and others interested in commercial aviation to see such a display of interest on the part of country residents. Even though the venture is to be supported by a Government subsidy it is most important that it should have the goodwill and enthusiasm of the public behind it.

REBUILDING AN AEROPLANE

AMONGST the most recent additions to the aircraft world is a machine rebuilt at Richmond by Captain E. W. Percival

The 'plane is an *Avro,* but is redesigned for and fitted with a 100 h.p. *R.A.F.* engine.

It will be remembered that Captain Percival fitted an *Avro* with an 80-100 h.p. *Renault* engine last year, this being the first *Avro* in Australia to be fitted with a stationary engine.



The "Avro" rebuilt by Captain E. W. Percival, at Richmond (N.S.W.).

The *Renault-Avro* having proved so successful, Captain Percival was asked by a Queensland firm to rebuild an *Avro* and fit it with a 100 h.p. *R.A.F.* engine. The machine was tested on August 24; the Superintendent of Aircraft (Captain Follett) being present. The 'plane rose in sixty-eight yards and climbed to two thousand feet in three minutes. The speed on the level is about eighty-five miles per hour. The machine proved easy to handle in the air, and is excellent for "stunting" purposes.

The normal engine revolutions are one thousand six hundred per minute, but it can be throttled down to one thousand two hundred and fifty revolutions without the 'plane being detrimentally affected even with a load aboard.

Captain Follett expressed his complete satisfaction with the rebuilding of the machine and with the modification for the stationary engine. He issued an airworthiness certificate on the spot.

Captain Percival has with him as chief mechanic, Mr. J. G. Beohm, who was one of the very few A.I.D. inspectors in the A.F.C. He has had considerable experience in the *De Haviland* and other aircraft works in England, as well as in the aeroplane repair section of the A.F.C. He saw service in France.

Before commencing to rebuild the above machine, Captain Percival returned from a three months' most successful tour of the northern part of the State in his *Renault-Avro* machine. One of the features of the tour was the complete absence of engine trouble.

"DOCKING" A GIANT DIRIGIBLE AT AN AERIAL PORT

The steel latticework dirigible mooring mast has reached such a stage of development that "docking" one of the giant airships is very like warping an ocean liner into its wharf. Towering one hundred and fifteen feet, the fragile-appearing mast, built for toughness and strength rather than rigidity, is fitted at the top with a revolving platform, a concave conical recess for the nose of the ship, strong steel mooring clamps, and a system of cables and winches.

When a dirigible is sighted, the platform is turned so that the nose fitting points down wind. A six hundred-feet steel cable, running over pulleys and through the nosepiece, is then drawn out in the same direction, ready to be attached to another dropped by the ship's crew. Immediately this is done, the signal "haul down" is given, and the winches, reeling in the cable, gently draw the unwieldy craft to its resting place. The cables are not trusted to hold the ship, but after the nose is drawn snugly into the conical fitting, the mooring clamps are applied. Not only is the tower platform free to revolve, but it is also mounted in such a way on gimbal bearings that it rocks easily at all angles. This permits the great craft to respond to every vagary of the wind without being subjected to racking strains.

While the actual landing and housing of a dirigible requires a crew of three hundred to four hundred men, only six are needed in the mooring operation.

TOURING IN NEW ZEALAND

THE LAND OF ENCHANTING SCENERY

QUEEN CHARLOTTE SOUND TO BLENHEIM

TO travel on the ferry steamer running north from Lyttelton to Wellington, and gaze on the snow-clad crests of the Kaikoura Mountains is to feel a strange longing to inspect at closer range the beautiful scenery which one naturally associates with such a vision. Below the line of snow-clad peaks visible from the ferry steamer and running close along the sea, is a delightful drive of over one hundred miles, which takes the traveller to the town of Kaikoura and beyond it to Christchurch. Even in the winter season the air is quite warm when traversing this road, and towards Kaikoura, behind which stands high country, the locality is justly entitled to be known as the "Land of Summer."

In the autumn of the year, when the rays of the setting sun shine through Cook Strait, they give a wonderful touch of beauty to the Wellington hills and the waters to the eastwood which the ferry steamer has just traversed. To the westward, "The Brothers" show as black sentinels in the sun's path. Ahead lies Arapawa Island and beyond is seen the Marlborough hills lying in a half shadow.

To enter Queen Charlotte Sound when the shades of evening are falling is to behold a scene of surpassing beauty. When traversing it during the day the traveller will see silhouetted against the sky the figure of a man standing on a cliff to the left. It is the look-out from Te Awaite whaling station, which is two miles inside the Sound. From dawn till nightfall, a watcher stands there, while below at the station, fast motor launches are kept ever ready to dash out when the lookout signals that a whale is in sight. The whaling season lasts from May till September, and during 1918 no less than forty whales, yielding two hundred and fifty tons weight of oil, were caught off Te Awaite. The whaling industry is an important one in New Zealand and results have amply justified the installation of the modern methods of whaling with which the stations are equipped. The Te Awaite station was established in 1827, the year when Captain Guard's whaling schooner was driven into Tory Channel by stress of weather. For a time it was the only white settlement in the South Island, and the whalers had many thrilling experiences with the Maoris who abounded in the locality.

When nearing the head of the Sound, the steamer turns to the left into a bay from where the lights of Picton are visible, forming a strange contrast to the deep shadows which lay all around. A long concrete wharf runs out into the water, and it is alongside this that the steamer moors, and lands her passengers, mails and cargo. For those who wish to complete the journey to Blenheim, a train is waiting on the wharf. Even at nighttime the picturesqueness of the town is so apparent as to make one wish to linger awhile and see more of its beauty. Picton is the centre of a widespread community, and lies in a broad valley, girt on three sides by high and thickly wooded hills. All day long the sun shines on the town, while it is protected from the bitter south winds by the towering hills. Houses are clustered all over the valley and hillsides. The township is one of the oldest in the Dominion. The settlement was started in 1848 by an enterprising New Zealand Co. Waitohi Bay, as it was then called, was occupied by a Maori Pa, but the natives were induced to remove to Waikawa Bay, three miles away, by payment of £100 in gold, together with an undertaking to plough a similar area there to that which they had under cultivation at Waitohi, and to build them a church. This transaction was completed in the same year, and the new township began to grow. At first it was called Newtown, but later on the name was changed to Picton, while to the old settlers it was still Waitohi Bay. In 1856. Colonel Gore Brown, who succeeded Sir George Grey as Governor, visited Picton in the steamer *Zingari*. Two years later, Marlborough was made a province with Picton as its capital.

The discovery of gold at Wakamarina brought hundreds of people to swell the population and increase the trade of the town. Coal was also located at Shakespeare Bay during the gold rush, but the cost of winning it proved prohibitive and prospecting was dropped for the time being. In 1875 provincial government was abolished, and the gold and timber industry dying out, the progress of Picton ceased. The beauty of the place did not, however, deteriorate, but rather increased as time went on. During recent years the place has taken a fresh lease of life and has become one of the best appointed towns in the Dominion. An electric lighting and heating service, driven during the day and early evening by a suction gas plant and during the night by water, is one of its up-to-date features. A high-pressure water supply brought from a valley in the hills, and a modern sewerage system, give a touch of "up-to-dateness" which many of the larger towns lack. There are many beautiful walks and drives around Picton, while to those who prefer a motor-launch trip the daily mail services to the various localities around the Sound afford an excellent opportunity of visiting spots of great charm.

A lake scene in the South Island of New Zealand.

The town of Blenheim is eighteen miles from Picton and boasts no less than three rivers, two of which, the Opawa and Omaka, flow through the town, while the third, Taylor, passes by on the outskirts. The two former are tributaries of the Wairau, on which the small steamers trading to Wellington run. The settlement on Wairau River began in 1840, when a Sydney resident, a Mr. Unwin, together with a number of employees and their families, arrived in Cloudy Bay in the ship *Hope*. Cattle and sheep were also landed and some of the men began to erect a cottage. The Maoris intervened, however, and murdered the settlers, in revenge, it is alleged, for the murder of a Maori woman by a European. The years which followed were full of incident, culminating in 1843 in a conflict between the whites and Maoris, in which several magistrates and many men, as well as a number of Maoris were slain. A monument was afterwards erected to mark the spot where this lamentable happening occurred.

The settlement of Wairau continued to grow and in 1847-48 there were big additions to the number of people located there. As time went on the town grew in size and importance, until to-day Blenheim spreads over an area of one hundred and sixty acres, and boasts a population of upwards of five thousand people. Like Picton, it has most of the appointments of a modern township, and its public buildings are excellent examples of up-to-date architecture. The surrounding country is mostly devoted to agricultural pursuits, and beyond the smiling orchards and fields covered with flourishing crops, lie the mountains of which Marlborough is justly proud. Here the explorer and lover of nature may feast on the beauties which are to be found on every hand.

BOOK REVIEW

AIRCRAFT YEAR-BOOK, 1921; Published by the Manufacturers' Aircraft Association, Inc., of New York.

The development of aviation throughout the world offers tremendous scope for dealing with the many and varied avenues of the world's activities in which the aeroplane is now a familiar sight. Even the man in the street, who looks upon aeronautics as something far removed from his circle in life, would be tremendously interested if only he could be induced to delve beneath the surface and examine the record of aviation, particularly during the past twelve months. It is unquestionable, therefore, that a hearty welcome awaits the handsomely bound volume, "Aircraft Year Book," which has just been published. The work deals with the development of aviation in a form which will appeal to the average person anxious to keep in close touch with the record and possibilities of such an important industry. One instinctively associates the contents of a year-book, with a dry, technical *résumé* of the subject with which it deals, but the volume under review, while it provides all the detail necessary to the thorough discussion of such a subject, is decidedly interesting and readable to every layman. In addition it is profusely illustrated, the photographs dealing with many unique and historical events which have occurred in America since aerial navigation became a living factor in the country's affairs.

The letterpress, amongst other things, deals exhaustively with the operations of America's aerial mail services; the organisation of air patrols to detect forest fires, and the value of aeroplanes for photographic and news-gathering purposes.

At least one of the novel uses to which aircraft has been put during the past year is in spotting shoals of fish and communicating the size and location of same by wireless to the fishing stations.

The motion-picture companies have used aeroplanes extensively in recording various events which they desired to feature, and it is recorded that on one occasion the mountain location required to form a setting for a big production was discovered from an aeroplane.

The book is cordially recommended to the aircraft enthusiast and general reader.

Queenstown, Lake Wakatipu, New Zealand.

"BURYING THE SPIRIT"

A WEIRD CHINESE CEREMONY

DEATH has come to our hutung or street, and in its wake has come one of the wierdest and most pathetic of oriental customs, the night procession from the home of the deceased out to the burying ground, preparing the way for the burial that is to come in the near future. Early in the morning we were awakened by the deep note of the funeral drum and the squealing of the horns that wail for both weddings and funerals. The big drums, with their black lacquer and bright golden dragons and scroll ornaments are always hung in their big black and gold frames at the door of the house; so it is never hard to tell where services are being held for one who has gone. These native bands are always tempting to a photographer; but let a foreigner look at one through the camera, and there will be no more music until he and his black box have left the scene.

To-day the music has been going constantly. Once a procession, apparently of friends, came to the house, and their coming was heralded by their three-piece band. To-night a new and different kind of music started. There was the shrill horn, but it was a different drum, and the whole band had a very different quality as well as an altered tune. Looking out of our gate we saw coming down the street the night procession that goes with some of the Peking funerals. At first all that could be seen was the dark outlines of the houses along the hutung, with the little street-lights making their glowing spots along the way, and off in the distance a bright light. Slowly the procession came toward us, and the light became brighter and gradually broke up into separate flares, and we could see the dark shadows of the men.

First came the band, headed by a man with a big gilt drum strapped to his waist. He was beating it as hard as he could. The light was all behind him, so we could only see the outline of his form and the glint of the gilt paint on the drum. Back of him came the players of two horns and of a fife. They were a little brighter, but still the light was behind them, and dark outlines were all that we could see. There was still another member of the band, who used his breath to bring some noise from a native instrument that looks like a cross between a musical instrument known in America as a sweet potato and a Scotch bagpipe, there being a circle of pipes, all of different lengths for the different notes. The largest of the pipes was perhaps ten inches long. Just what was the contribution of this instrument to the general noise we could not tell, for the horns drowned out any squeal that it may have been making.

Then came the men who were carrying the flares. Most of them were dressed in the white of mourning, and all were carrying in the hand nearest the centre of the road a flaming bunch of incense. The flickering flames brought strange high-lights on the marchers, but always just ahead of the group, and a little way behind, we could see the solid dark of the hutung, broken only by the small street lights.

Most of the family, at least those who wore mourning, were in the group carrying the flaring incense, but just back of them came the son of the man who had died. He, of course, was dressed in full mourning—white unbleached long gown and coarse dirty white hat—but on his shoulder he wore a red bat, a symbol of long life. He was weeping bitterly and had to be supported and guided by two attendants. Their mourning garments showed that they belonged to the family but, as their position was not that of chief mourner, they did not have to weep. Still farther back, at the end of the procession, came a group of Buddhist priests, a dark unlighted series of shadows that had no high lights. And from the centre of the group came the tinkle of the gong.

The procession passed by, the shrill music became less and less sharp, the

separate lights disappeared, and just a glow seemed to rise from the centre of the party; the darkness came back to our part of the street, and soon it was as quiet as though all the houses were asleep. Yet here and there rose the mournful call of the street peddler.

Why all this, without any coffin? Because this is the way that the Chinese here have of leading the spirit of the departed out from the home to the burying ground. The music is kept shrill and high and loud so that the spirit can hear it; the incense is kept flaming in the dark so that the spirit can see the way, while the tears of the nearest relative are flowing so that the spirit will feel it is missed and come as close as it can to those left behind.

And so gradually the party makes its way outside the city, to the plot of ground that has been chosen, the "lucky" burial place for this particular man. There the son will "kowtow" and wail for his departed father, a paper horse and cart will be burned for the use of the spirit in the other world, and a supply of silver and gold paper money will be sent through the flames so that there shall be no unsatisfied want over there.

In a few days, or perhaps a week or two, concludes Sidney D. Gamble, in *The Continent*, the body will be taken out to the grave by a big procession carrying wreaths, banners, silk umbrellas and paper servants; and the coffin will be lowered into the ground and very carefully located so that it is in the proper line by the compass. It cannot be in the direct north-and-south line, for only an emperor can be buried that way, but the necromancer's compass will show just where the coffin can be placed so that its centre line will be on the exact division between two of the eight selections of the "fungshuei" of the circle. Then some wine and vegetables will be placed at the head of the coffin, a little of the soil from the favourite haunts of the departed will be thrown into the grave, the hole will be filled in—and another grave mound will have been added to the millions in China.

The whole idea and belief belongs well to the night. Ahead, blackness; back of those going out, nothing but the night shadows. Though close around the mourners there may be a little circle of light, the darkness presses in from every side and again takes possession of the street when they have passed but a little way. The deep spirit of the orient, underlying the daily round of life, seems to be one of darkness and of night.

WIRELESS PATENT ACTION.

Judgment for the Marconi Company.

As the result of an action brought against Messrs. A. W. Gamage, Limited, by Marconi's Wireless Telegraph Company, Limited, for the infringement of two Marconi patents (C. S. Franklin, No. 13636, of 1913, and H. J. Round, No. 28413, of 1913), judgment by consent of the defendants has been given by Mr. Justice Eve in the High Courts of Justice. By this judgment Messrs. Gamage are to pay £150 agreed damages and the Marconi Company's taxed costs, and are ordered to destroy all wireless receiving apparatus made or used by them (including "Polaris" receiving apparatus) infringing the above-mentioned Marconi patents.

LONG-DISTANCE WIRELESS WORK AT SEA.

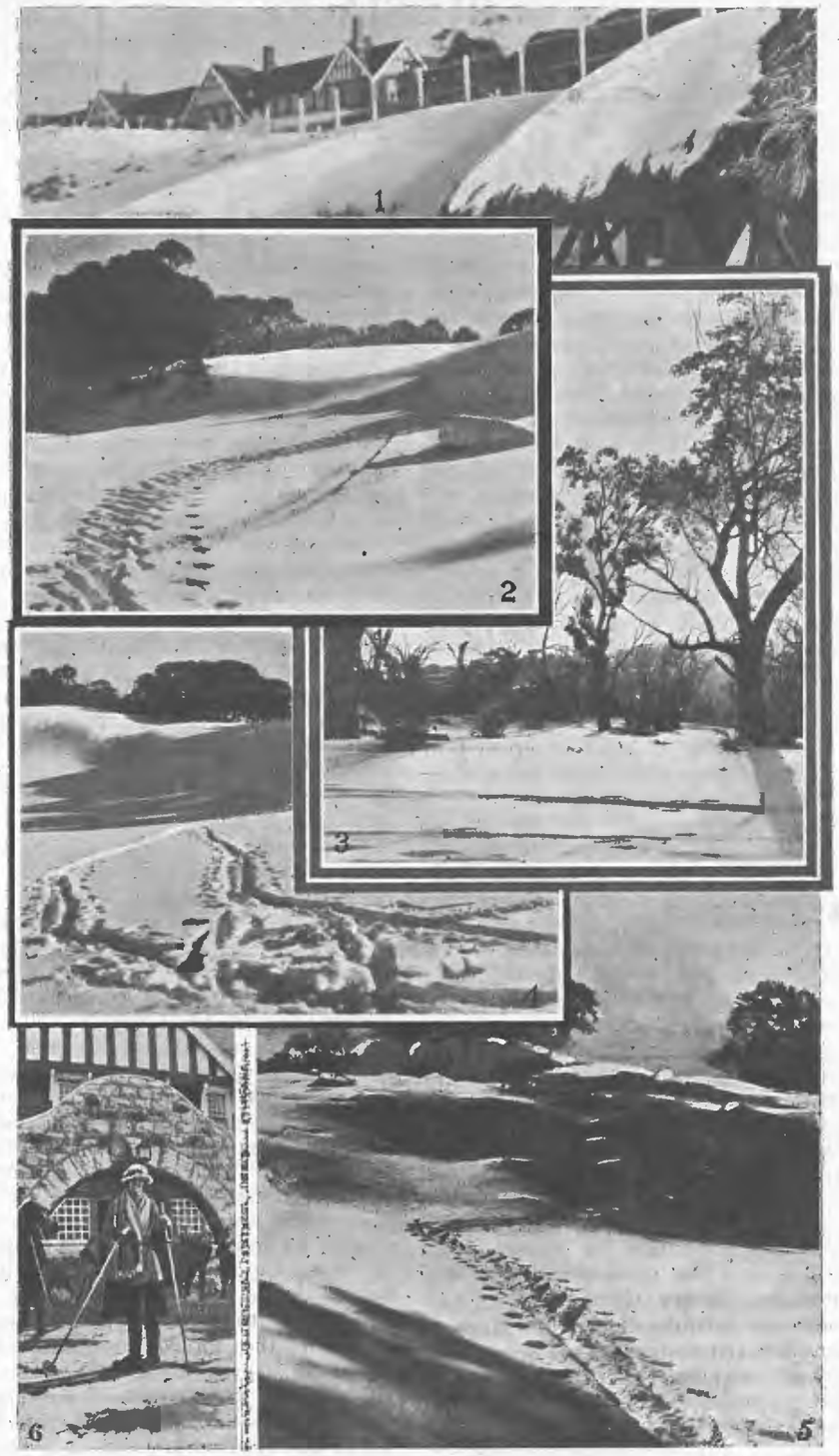
Ship Communicates 6,180 Miles.

On the last voyage of the Canadian-Australian R.M.S. *Makura*, an excellent piece of wireless work was performed.

The vessel left Auckland, N.Z., for Suva, Fiji, on July 12, and twelve hours after departure her position was transmitted direct to Pearl Harbour, Honolulu, three thousand eight hundred and twenty miles north.

In addition to Pearl Harbour wireless station copying the *Makura's* signals with ease, the Merchants' Exchange wireless station at Vancouver heard the signals, copied them, and the ship's position was published in the Vancouver newspapers the same day.

The *Makura* was, at the time, six thousand one hundred and eighty miles south of Vancouver, and the efficiency of the apparatus and the operators speaks for itself.



Snow scenes near Mount Kosciusko, New South Wales.

RUSSIA

(Conclusion.)

By H. H. JOHNSON

THE last article concluded with a brief reference to the rebellion of 1917, the deposition of the Romanoffs, and the seizure of Governmental authority by the "Bolsheviks."

The word "Soviet" which occurs so frequently in the press is a Russian term at first applied to a revolutionary committee of workmen in 1905, and later extended to a large variety of revolutionary councils and committees. It is used especially of that form of government in which the unit of industrial organisation becomes the nucleus of political organisation.

The word "Bolshevism" (meaning majority) is a term loosely used to denote:

(1) The Communist party now in supreme control of what remains of the Russian Empire.

(2) The Russian Socialist Federal Soviet Republic.

(3) A proposed international world order to consist of a loose federation of national Soviet republics under the control of the workers of the world.

(4) Any party or movement having the same general aims of conquest of absolute political power by armed revolution of the propertyless working class.

The word "Bolshevik" was originated in 1903 to designate the majority of the Russian Social Democratic Labour Party. During the great revolutionary ferment of 1903-5 a profound cleavage, both as to the ideals and methods of attainment of the Socialistic State, developed between the two factions of the party, and the Bolsheviks, no longer the majority faction, became the radical left wing, sharply differentiated from the great majority of Social Democrats in their programme. They sought amongst other things the early attainment of Socialism not by evolution, but by a *coup d'état* of an armed and desperate proletariat.

Russia was undoubtedly on the verge of a great anti-Czar revolution when the Great War broke out in 1914. With other Socialistic groups, the Bolsheviks joined in a Peace Manifesto, branding the War as a crime against the internationale and refusing to vote war credits, and although the majority of the Socialists soon rallied to the defence of the Fatherland, the Bolsheviks continued to plan a revolution. The Government suspected a plot and arrested the leaders at a revolutionary conference at Viborg on November 17, 1914.

From this time on, until the overthrow of the Czar on March 16, 1917, and the establishment of a provisional government, the Bolsheviks played a small part in the history of Russia. The former was effected by two forces, the patriotic group in the Duma and the revolutionary force of soldiers and workmen which soon afterwards organised into Soviets or revolutionary councils. The Duma group at first assumed complete political power, although the actual strength of the movement lay in the soldiers of the great garrison city of Petrograd supported by the radical workmen. The soldiers at the front and the sailors of the fleet represented a third group, while a fourth and powerful group consisted of the peasants who demanded, as in every previous Russian crisis, "land for the people."

The Bolsheviks watched closely for the opportunity to attain supreme control. The insurrection of General Korniloff gave them that opportunity. Riga was shamefully surrendered to the Germans and panic reigned in Petrograd. Korniloff charged Kerensky (the head of the Government) with collusion with the German General Staff under pressure from the Bolsheviks. Kerensky ordered Korniloff's removal, but the latter replied by despatching troops from the front to seize the Government at Petrograd. The Bolsheviks at once raised the cry of counter revolution. The revolution must be saved from the agents of the Czar. Korniloff was to the Bolsheviks one of the old, hated régime. The Korniloff forces melted away before Petrograd was reached, but the battle-cry, "Save the revolution!" was turned against the Kerensky Government, and revolutionary troops (Red Guards) were formed of deserters from the army. On November 6, 1917, the Bolshevik coup took place, and

on the 7th most of the members of the Government were arrested, although Kerensky escaped.

A new Government was formed under an executive committee called the Council of Peoples' Commissaries, with Lenin as President, and Trotsky as Commissioner of Foreign Affairs. Lenin was dictator of Russia in the name of the proletariat and by virtue of the power of the Red Guards. Thus, the Russian Socialist Federal Soviet Republic was born. The constituent convention was looked forward to as the salvation of Russia. The Bolsheviks, however, only elected a minority, but contrary to their public declaration to hold power only until the convening of the constituent convention, they began to plot its overthrow. The Red Guards broke up processions and demonstrations in favour of the convention which had approved of the nationalisation of mines, forests, etc., but refused to abdicate to the Soviet Committee and was disbanded by armed force.

The Lenin-Trotsky Ministry had summoned a congress of Soviets to meet in Petrograd at the same time. This congress approved the Soviet form of Government which the convention had spurned, and the provisional constitution adopted was later revised and adopted by the fifth Soviet congress on July 10, 1918, as the permanent constitution of Russia.

Of articles on Bolshevism there is now no end, and difficult as it is for a reader to conjure up before his eyes the vaguest picture of Bolshevism as a political philosophy, he is completely nonplussed when he attempts to form an estimate of the character and personality of the man who is its creator and chief exponent.

Lenin is by no means an easy man to know; for years being enveloped in a veil of mystery. His all-absorbing passion is the gospel of world revolution. Born at Simbirsk on April 10, 1870, Vladimir Ilitch Ulianoff, *alias* Lenin, is a hereditary noble and the son of a State Councillor. His mother had a small estate in the Kazan Government and after her husband's death was in receipt of a State pension. Lenin's two sisters and his brother Dmitri were all at one time under public supervision, while his brother Alexander was executed in 1887 for complicity in a terrorist plot. Lenin is one of the few genuine Russians to be found among the Bolshevik leaders. He has been exiled for three years to Eastern Siberia for his socialistic activities and after his release he went to live abroad.

His knowledge of languages is above the average. He is certainly the greatest intellectual force which the Russian revolution has yet brought to light. In his creed of world revolution he is uncompromising, and in his code of political ethics the end justifies the means. To him, Capital is the fiend incarnate, and with such an enemy he neither gives nor asks for mercy. Where Trotsky might shrink through fear of the consequences from shooting ten thousand people in cold blood, Lenin would not hesitate if he thought such an action essential to his cause.

In many political crises through which the Bolsheviks have passed during their tenure of the Russian political stage, Lenin's has been the master mind which time and time again has averted almost inevitable disaster. Cold, pitiless, devoid of all sentiment, utterly ruthless in his efforts to force the narrow tenets of his Marxian dogma upon the whole world, he is not a lovable character. Bolshevik Russia has in him a master and in his heart every Bolshevik knows it.

Between Lenin and Trotsky there is a wide contrast. The former, short of stature, rather plump, with thick neck and broad shoulders, bald head and short, stubby beard, might easily escape notice in a gathering of Sunday-school teachers. Trotsky, with his long, prominent nose, piercing black eyes, huge forehead and heavy, protruding lips is the very incarnation of the revolutionary spirit.

He was born in 1877, the son of a provincial chemist. He is a Jew, his name being Leiba Bronstein. From his earliest years he has been in revolt against Society. He was exiled to Siberia three times, the last time for life, but escaped and disappeared abroad, where he supported himself by journalism. Trotsky has not always been a Bolshevik, and at one time formed a party known as the "Trotskists," whose aim was to steer a course between the moderate Menshevisks and the radical Bolsheviks. Lenin regarded Trotsky's action as tainted with Chauvinism. To-day he has committed himself irrevocably to the Bolshevist cause. Unlike Lenin, Trotsky is all fire and passion. While Lenin sneers at public honour, Trotsky makes great play with the word. He was defending Russia's "honour" at Brest-Litovsk, which infamous treaty was ac-

cepted sullenly by the fourth Soviet Congress at the instance of Lenin, although strenuously opposed by Trotsky, because his dignity had suffered an affront. His organising talents have been of the greatest service to the Bolsheviks. Impetuous and hot-headed, he is apt to solve every crisis with a wild shriek: "Off with his head."

Among his colleagues, Trotsky does not enjoy the same respect or admiration as Lenin.

One of the most curious features of the Bolshevist movement is the high percentage of non-Russian element amongst its leaders. Of the twenty or thirty leaders not less than 75 per cent. are Jews. Karachan is an Armenian; Peters, the leader of the Moscow Extraordinary Commission, is a Lett; only Lenin, Bucharin, Petrovsky, Tchitcherin, Lunacharsky and Krilenko are Russians.

If Lenin is the brains of the movement, the Jews provide the executive officers; Trotsky, Zinovieff, Kameneff, Stekloff, Sverdloff, Uritsky, Joffe, Radovsky, Radek, Menjinsky, Larin, Bronski and others all being of the Jewish race, while among the minor Soviet officials the number is legion.

Lenin's closest friend during many years of exile has been Apfelbaum, *alias* Zinovieff, who was born in the Ukraine in 1883. He came under Lenin's influence in his early youth and has remained under it ever since. He has a cruel face and is regarded chiefly as a phonograph of his master with whom he has a greater influence than Trotsky. As virtual dictator of Petrograd, he is responsible for the savage cruelties and murders which have been committed there in the name of the revolution.

Sverdloff, the President of the All Russian Executive Committee, is of the same bitter implacable type as Zinovieff. He has a striking figure somewhat after the manner of a Spanish Inquisitor.

Krilenko, another leader, affords a striking example of the depths to which the mind soured against Society can sink in its contorted perversion. Krilenko, the ex-Commander-in-Chief, the author of the notorious fraternising order which finally destroyed the Russian Army, has become the blook-sucking public prosecutor, who even in crime it would be a compliment to compare with Marat of the French Revolution. In his thirst for blood he is as insatiable as a drug fiend, and yet he received a University education and practised as a lawyer.

Tchitcherin, the nominal Foreign Minister, is one of those mystical, sentimental revolutionaries who owes his position more to the genuineness of his beliefs than to his ability. He held the rank of nobleman and inherited a considerable estate from his relations, which as a Socialist he voluntarily resigned. He has written more diplomatic notes in a shorter period of time than any other Foreign Minister in the world.

Karachan, who is an anti-Turk, and has no love for the Central Powers, is popularly supposed to be at the head of the wide system of Secret Service which the Bolsheviks have apparently employed with considerable success. He belongs evidently to that class of Bolshevik which believes that the pen is mightier than the sword. In their methods the advocates of open diplomacy differ little from the Bernstorffs and the Mirbachs whom they have so consistently pilloried.

Radek, the leader-writer of the official organ *Izviestia,* is intellectually brilliant. As a student of economics and foreign politics he seems to have amassed a wonderful store of knowledge. Starting his career in Russia with considerable disadvantage as an Austrian subject, whose knowledge of Russian was far from perfect, Radek has gradually increased his prestige until to-day he stands as one of the most powerful influences inside the Bolshevist party. He is one of the few who ever provide Lenin with an original idea.

Krassin, who recently visited England, is undoubtedly the ablest man in the Bolshevik Government from the standpoint of practical business. At St. Petersburg (Petrograd) he received an excellent education as an engineer. He went to Germany, presumably taking refuge there because of his political views, returning to Russia after the Revolution in 1905, and became the representative of German interests there. In theory he has always been considered by his colleagues as a brilliant, industrious organiser, and enjoyed their friendship. It is not clear as to how he arrived at his present position as Commissioner of Trade and Industry. He is known as extremely pro-German, and it is quite possible that he owes his present position to German influence. It is hardly possible that he is a believer in the Bolshevik economic programme, and it is more than likely that he is applying his knowledge and ability to modifications of that programme in the direction of organisation of production with the aid of German specialists.

Finally, there is Maxim Litvinov, who is the chief Bolshevik representative abroad. He is a Jew whose real name is Meyer Wallach. In 1901 he got into difficulties with the authorities and was imprisoned, but escaped and got out of the country. In 1906 he was commissioned by the revolutionary party to purchase arms abroad, and later returned and lived in Petrograd on a German passport under the name of Gustave Graf. He is clever in address and shows considerable dialectical ability in setting forth the Bolshevik theory and in explaining Bolshevik international policy.

Russia at the mercy of such men has a tragic history. The self-confessed enemy of all democratic government, the Soviet Republic, is described by Lenin as the dictatorship of two hundred thousand members of the Bolshevik party over fifty million Russians.

Under the Socialistic experiments of the Bolsheviks the very elements of economic life appear to have been destroyed. Industry is dead. Transport is non-existent. Credit, finance and business have been reduced to a mere barter of commodities.

The strength of the Bolshevik movement as an organised Government has largely been in its use of the native institution, the Soviet, which are of many kinds, of which the village or factory group is the unit. Central Soviets of delegates from local bodies are formed in all townships, districts and provinces, and the national soviet of delegates is called together at least twice a year. All soviets are responsible for the enforcement of "general" laws as well as local ordinances and degrees.

Limitations of franchise vitiates the equity of representation. Only the poorest peasants and the propertyless workers are permitted to vote. The following classes are disfranchised:

(a) All employers of labour, including servants.

(b) All capitalists or others receiving interest, rent, dividends, etc.

(c) All merchants, traders and dealers.

(d) All clergymen and priests and employees of religious bodies.

(e) Certain former officials of the Czar's Government, criminals and insane.

The professional class, *i.e.,* the intelligents and those engaged in the management of history are, however, usually permitted to vote.

Whilst the Bolshevik revolution is frankly an economic overthrow of the Capitalistic system, it is also a challenge to the independence of each individual. Capitalists are represented as the real enemies of the people and no justice, mercy or compassion is allowed them. Private property has been confiscated by the State. Houses and small personal belongings are exempt.

All land has been nationalised, also all live-stock, agricultural and natural resources, all banks and banking institutions, all church property, all public meeting places and assembly halls. Insurance has been made a State monopoly and also the transportation business, the publication of newspapers and periodicals and (largely) books, all advertising and foreign trade. Compulsory labour has been made universal, and also compulsory military service. All foreign debts and debts due to landlords and capitalists were repudiated. The right of inheritance is abolished and estates of all descendants confiscated. The right to manage and operate factories is vested in the workers, the right to divide and cultivate the land and enjoy the fruits thereof is vested in the peasants. The right to employ any human being in any capacity is annulled, co-operative production is permitted and revolutionary tribunals are vested with unlimited power of arrest, trial, and imprisonment.

The war-born Russian Soviet Republic is looked upon as a transitional socialistic State. The ideal aim may be summed up in the familiar terms of a communistic Utopia, "the complete liberation of the working classes from spoliation and oppression." The Soviet's general invitation to all revolutionary organisations to join the family of Soviets is a veiled threat against all organised Governments.

The event giving the Bolsheviks the opportunity of seizing power, has been re-

ferred to, but what was the cause of the revolution in Russia and what are its effects?

It was not a sudden explosion of wickedness and devilry on the part of men, but was the final act of a long train of events. The Bolsheviks claim to be followers of Karl Marx, and they adopted the propositions laid down by him as their programme. This means literally the abolition of private property and the socialisation of all means of production and distribution. Their attitude on the question of compulsory labour was that if the people would not work they should be made to work.

The French philosopher Daudet, said he believed that there is no greater abyss than class distinction. Australia has shown that a country can have a self-governing community without an aristocracy, but the doctrine of class-selfishness as a natural and unavoidable basis of human government, has challenged the democratic faith in the equity and inherent rights of all men, regardless of class or economic status. The true aspirations of Labour will be readily conceded by all thinking men. Somebody has said that democracies are proverbially ungrateful, but if Capitalism is abolished what is going to take its place?

The Bolsheviks' ideal socialistic aim, "the complete liberation of the labouring classes from spoliation and oppression," is merely an empty phrase. Lord Emmott's committee concluded its report on Russian internal affairs by stating that there is no possibility of an economic regeneration of Russia without the assistance of Capitalist countries. The committee doubted whether so much human misery has ever been the lot of any nation in the history of the modern world. This is the effect of Socialism in a country where Tolstoy described society as a "Cone of Violence."

In our own empire we seem to be involved in friction and distrust. Wealthy men fear Socialism. The working men's minds are full of restless obsessions and suspicious fears of Social injustice which rules them as remorselessly as the neurotic is ruled by his irrational dread of imaginary foes. No attempt to find a cure either in the devices of co-partnership, arbitration courts or legislative action is contemplated, because the causes touch man's very soul, but the devious ways in which the Bolsheviks have attempted to make a success of their theories when put to the practical test, ought to convince any man of ordinary capacity and common honesty that Socialism is impossible without bringing about the very oppression of the working class which it is the ideal aim of the Socialists to prevent.

The Communists were so confident that money was dying a natural death that they joked over the "historical services of the printing press," but the finance problem is now most dangerous in Russia. The Russians with hundreds of thousands of millions of paper money are not suffering from too much, but from want of money. The reason is that money was never circulated. The peasant who once received money could not spend it again and so accumulated millions. So soon as the towns are able to offer manufactured goods the peasants will flood Russia with their stupendous heaps of money. The value of money will consequently fall tremendously and the workers in towns, who have comparatively little money will suffer severely.

The Bolsheviks are restoring trading which means the restoration of Capitalism. They have reached the conclusion that it is time to throw aside the sluggish belief in decrees and give up the desire to subordinate small industry to a nationalised big one.

They are also reported to have brought in a Bill to remove the restrictions on the possession of money by private persons and money which has already been seized will be returned to owners unless it has been confiscated by judicial process.

The British Prime Minister in the House of Commons recently said there was evidence of a clear change in the attitude of the Bolshevik Government towards Capitalism and private enterprise, communism, and even nationalisation, and that some of Lenin's recent speeches might be described as an antidote to the Labour Party Propaganda.

CHASING TIME AROUND THE WORLD

WIRELESS AND AEROPLANE HELP JOHN HENRY MEARS TO MAKE THE RECORD

IF any rash jester of the days when the wise ones firmly believed in what they called magic had jingled his bells, and said that a man could go round the world while the moon was going through its phases, the answer would have been:

"That's all moonshine."

But if John Henry Mears, representing the New York *Evening Sun*, has not quite clipped the moon's record, he has at least beaten all the globe-girdlers of this planet. The latest of these, Andre Jaeger-Schmidt, took over thirty-nine days for the trip. Mears finished in thirty-five days twenty-five hours thirty-five minutes and four and a half seconds. This was back in 1913, The schedule published before he started was exactly that, minus the fraction, which he lost greeting his friends at the station in New York. His rival, M. Jaeger-Schmidt, in telegraphing congratulations, declared: "To do better would necessitate abandoning the ordinary routes, utilising those of the air; it would be necessary to tour the world in an aeroplane."

Probably the most exciting crisis of a journey that was all crises, was the transfer by hydroplane, from the Pacific into the fog-shrouded continent of America, the other side of which had been left a month before. We will let Mr. Meares himself tell the story, in which the two most amazing inventions of the modern world play a great part:

"The last serious crisis of the trip was at the end of the Pacific voyage. I took to the yacht *Maud F.* off Quarantine at Victoria, being allowed to pass the customs without inspection. The yacht had been cruising about all night looking for the liner. But that night we were fifty miles beyond Quarantine in a fog so dense that the yacht had no chance of sighting us. I spent the night in the wireless house, getting messages about the fog from the Canadian Weather Bureau. The fog clearing, I went with the *Maud F.* toward Seattle and took the Christopherson's hydro-aeroplane fifteen miles out from that city.

"The change from the yacht was exceedingly risky. It was made after sundown. It was not until we reached the North Pacific pier that I learned that the last man Christopherson had taken flying over Puget Sound was then at the bottom of the Sound. But it did not matter. We had a great flight.

"I crouched along the steel wires, holding the canvas by the side of his seat, while I listened to the canvas give with a keen sense of the record America was to lose if it gave way entirely. The first time we tried to rise from the water we sank back with an easy roll, and the next time we took the air at the rate of sixty miles an hour, while I experienced one of the most surprisingly pleasant sensations of a round-the-world tour; sensations that were agreeably prolonged by my making the North Coast Limited."

Mr. Mears has this to say of the average daily record and the latitude in which he travelled:

"I made on an average 587 miles a day and twenty-four and one-half miles an hour for the complete journey. The shortest day's journey was from London to Paris, 287 miles. The longest day's journey—though it took only the fractional part of a day—was 955 miles. St. Petersburg was the point furthest north on my route, 60 degrees north latitude. Shimoneseki was the point furthest south, 34 degrees north latitude. The difference is 26 degrees or 1,794 miles, the width of the belt within which my travelling lay.

"The delay at London was not import-

ant, but necessitated the elimination of Moscow from my route. The *Mauretania* was delayed eight hours by fog. Knowing of my quandary an English aviator six times communicated with me by wireless, asking for the job of carrying me off the befogged vessel to London at the rate of a pound a mile. A pound a mile meant a sum of $1,500. Not so much the money as the risks of flying with a 'pound-a-mile' sportsman kept me from leaving the *Mauretania* by airship, and at that it was only when my friends on board, including Mr. Marconi as well as the ship's officers, impressed upon me that it was inadvisable to take up the flight after dark. We were off Fishguard at 8 p.m.

"At almost any of the most critical stages of the journey I know that had I learned the jig was up I could have sat down and laughed; for when I was still less than half-way round the world I had seen enough to keep me merry for life."

It is worth noting that Mr. Marconi, by whose invention the saving of time was effected on the Pacific Coast, was the counsellor of caution on the Atlantic. There's a time for twentieth century wireless and aeroplanes and a time for primeval prudence.

Early in his trip, the record-breaker secured an authoritative statement from a great shipbuilder as to the probable future speed of great ocean liners, which will have a bearing on the length of time this record will stand.

"Through the accident of my photographing two pretty little girls, six and seven years old, on the deck of the steamship from Dover to Calais, I learned that my record will not be lowered for many years by any improvement in steam navigation.

"The two little girls stood by the rail of the steamship as we neared our landing. They heard me "snap" them and they turned, laughing. But the landing was made and I had no time to chat with them.

"Then later on my way to Liege, as I paced the platform at Erquelimer, the two little girls ran up and said: 'Hello! You took our picture.' At that a gentleman stepped forward and offered me his card.

"'Are you Mears?' he asked. 'I think I recognised you by your baggage as described in the London newspapers. My grand-children have been much interested in your voyage.'

"The Englishman was Lord Aberconway, of 43 Belgrave Square, Bodnant, who told me he built the *Mauretania* and the *Lusitania*.

"'And probably no more ships as swift as they,' he said 'will ever be built again. It costs too much to run them and only extra heavy subsidies from the Government can make their duplication possible.'

"The Russians threaten to improve the time of the Trans-Siberian railway. This will not be for many years, if ever. Railroad time across the American continent can hardly be shortened. To throw my present record out of joint I figure that Jaeger-Schmidt or I must use the aeroplane from Fishguard to London, from Dover to Ostend, from Ostend to Berlin, from Berlin to Moscow, thus cutting off two days by making it possible to take a later steamer from New York, and this can hardly be before the aeroplane is in a much more improved state, when also my hydroplane flight to Seattle could be improved upon. Viewing the subject from all sides, I expect my record to stand for years."

In spite of his haste—or because of it—Mr. Mears had time to get a witty word from one of the most distinguished of living Statesmen.

"Norton Griffiths, member of the House of Commons, desired to introduce me to Sir Edward Grey," wrote the traveller in his diary, "but found that Grey had left Parliament and was away across the square.

"'Come on, we'll catch him,' said Mr. Griffiths, and he led in a chase that would convince anyone that 'dashes' are not confined to globe-circlers.

"'Sir Edward, Sir Edward,' he called, and Sir Edward turned around to greet me, as I came up behind the M.P., with this obviously just remark:

"'Out of breath already?'"

Another entry in that same cinematographic diary makes a New Yorker wonder if there is any kinship between the police that have been putting diners out of Healy's and their Russian brethren. In New York they don't wait till the man is drunk.

"At Ekaterinbourg I saw a drunken Russian being treated for *delirium tremens*. Six policemen in their gilded uniforms were tossing him up in a blanket very gravely. I was assured it was a sure cure."

Mr. Mears expressed a deep sense of gratitude to the Japanese railroad officials who helped to give America the round-the-world record. One sportsmanlike official wired Mears that he was sure to miss connections at Vladivostock and advised him to change his route. Then the Manchurian Chosen Express was held eight hours, losing all its other passengers to gain the privilege of carrying a record-breaker. The Japanese Government Railways made the young American their guest. He wasn't allowed to pay any fare, an example of Oriental tyranny that is not likely to bring on war. More of the traveller's own story, as he gave it in the *Evening Sun*, follows:

"I left Shimonseki on Wednesday, July 23, at 9.50 a.m. On Thursday morning at Ninomiya, the general traffic manager of the system gave me a luncheon which terminated just as we arrived at Yokohama. At every station along the way newspaper men boarded my train and rode a station or two along the route, interested, it seemed, more in my health than anything else, pressing upon me the necessity of returning their sincere bows in great numbers, interviewing me in broken, but the most amiable English imaginable. Those newspaper men were the newest of the new journalists, striking in their graces, American in their quick, keen grasp of facts.

"In all I must have been interviewed more than a thousand times in the last thirty-six days, and more than a third of these I should say were in Japan.

"The Canadian Pacific steamship management, fearing I would not arrive in time for the *Empress of Russia* sailing, had advertised a postponement to 6 o'clock. I arrived at 1 p.m. All my care departed, for I was ahead, by a couple of hours, of even the regular sailing time. My railroad friends took me to Tokio meanwhile, where we visited for an hour and five minutes.

"On my return to Yokohama I had a ride in a *jinrickshaw*, or *Pull-man-car*. The last interviewer who saw me in Japan asked me what I considered the pleasantest part of my journey, and when I said the part of it that lay through Japan, he was immensely pleased, and once more inquired concerning my health."

And the bill? Read on:

"To analyse my chief expenses: First, there was my 'round-the-world ticket,' which cost $565.28. That included the fares for all stages of the journey except those between Paris and St. Petersburg. The fare from Paris to Berlin was $22, the sleeper $6.43; from Berlin to St. Petersburg $30.12, with the sleeper there costing $8.25. Owing to my change of route from Harbin to Yokohama, there were extras amounting to $12.20, which, with sleeping car costs of $5 in the United States, brought the total cost of transportation up to $662.28.

"Then there were meals—they cost, with tips, $46.38. That sounds too little? Well, remember the steamship passages include meals. You know there are men (I'm not one of them) who save money by crossing the ocean; their meals cost more in a week in New York than the fare; so they get the trip thrown in.

"The meals for the nine days on the Trans-Siberian Railway cost $30.05—the tips were $3.40. Then there was dinner on the train from Calais to Paris, $1.80; dinner on the way from Paris to Berlin, $1.65; breakfast, from Berlin to St. Petersburg, $1.05; dinner, $1.80; and breakfast 90 cents. Add to that the meals from Chicago to New York, $4.05, with tips averaging 15 per cent., and you get a total of $46.38. If I hadn't been out record-breaking there would have been a couple more meals that the every-day passenger would have had to pay for, but at which I was a guest.

"The tips were mostly in the natural order of the average traveller's experience—dollars, half dollars and quarters for the services of porters at stations, etc. Then there was $14.75 for the people on the *Mauretania*, and $7 on the *Empress of Russia*.

"Many Europeans expressed complete astonishment that I should attempt to get round the world in record time having the use of only one language. I did not find the lack of other languages a serious handicap, for the reason, of course, that English is spoken so widely and because of my good luck in falling in with capable linguists."

EXAMINATION BY X-RAYS

BY

CAPTAIN L. E. BURT.

IN December, 1895, Professor Rontgen made the discovery that for some time held the interest of the whole civilised world. He found that photographic plates were fogged, even though not removed from their wrappers, when placed in close proximity to a glass tube exhausted of air to a certain degree, and provided with metal conductors communicating with the interior of the tube and electrically excited. He further found that certain salts, Barium Platinocyanide and Calcium Tungstate, became fluorescent when exposed to the tube, and objects placed between the tube and the screen, coated with the salt, cast a shadow, and that a deeper shadow was cast by an object of great density than by one of less density.

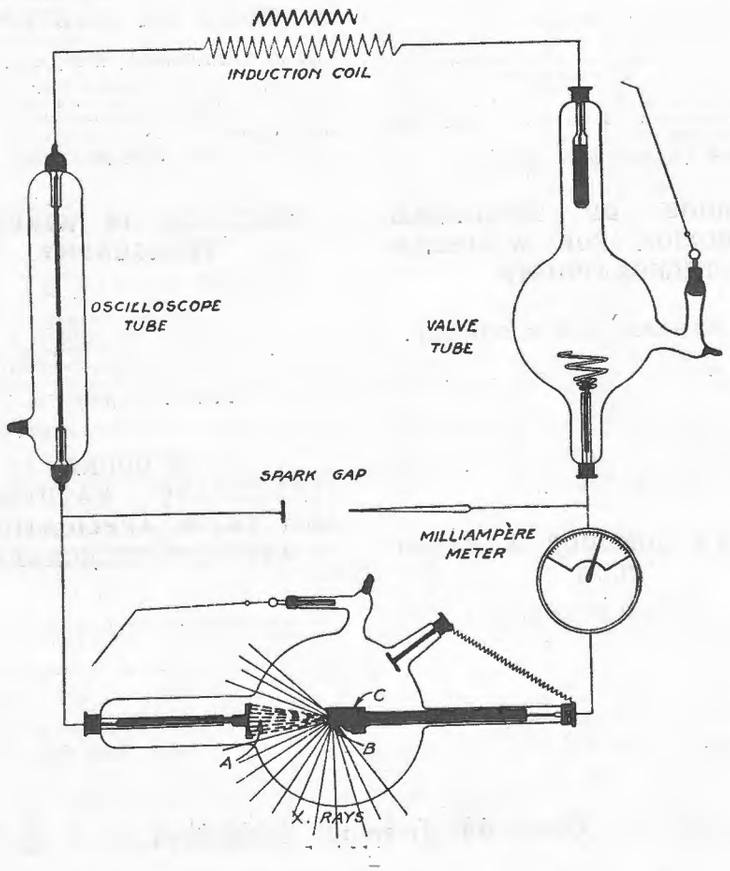


Fig. 1.—An X-Ray circuit when using gas tube.

He discovered also that if a photographic plate replaced the screen the shadow was registered on the plate as an "X-Ray Photo."

Crookes and other experimenters undoubtedly produced X-rays in their re-

search work, but failed to detect them. Immediately prior to the discovery of X-rays it was not anticipated that there would be further sensational discoveries in the world of physics. To quote from the introduction to "X-Rays" by that eminent physicist, Major G. W. C. Kaye, who of late years has done so much in furthering X-ray science: "In the early nineties it was not infrequently maintained that the science of physics had put its house in complete order, and that any further advance would only be along the lines of precision measurement." The new discovery, however, opened a fresh field for research work, and even to-day many of the "regions" have not been fully explored.

Fig. 2.—Radiograph of foot in boot.

The news of Professor Rontgen's discovery was quickly spread, and whilst the value of X-rays was to some extent appreciated as an aid to medical science, no one at the time seriously predicted the use of the rays for taking shadow pictures of steel plate inches in thickness for the purpose of detecting flaws or faulty workmanship. The illustrations in this article will, however, give some idea of what is now being accomplished in this direction.

It is interesting to note that when the news of the discovery reached Australia a number of people set themselves the task of producing X-rays. Most of these experimenters were hampered by the difficulty of producing a tube exhausted of air to a sufficient degree, but a few tubes designed to produce X-rays soon found their way to enthusiasts. In almost every State there are people who claim to be the first in Australia to use X-rays. A leading Radiologist was recently asked to recommend a certain appointment, and to take into consideration the candidate's claim to distinction in view of the fact that he was the first in Australia to take a radiograph, and that he was a J.P. The radiologist's reply was "that his own claims to distinction lay in the fact that he was *not* one of the first to take a radiograph, and that he was not a J.P.!" It would be interesting, however, to place on record the first Australian experiments, the nature of the apparatus used, and even the museums might interest themselves to the extent of making a collection of early X-ray tubes, etc.*

Apparatus to Produce X-Rays.

This consists essentially of a coil, transformer or other apparatus capable of converting electricity of comparatively low potential to a very high potential. The electricity is conveyed to the X-ray tube in much the same way as to an electric lamp so far as the circuit is concerned, but of course special precautions are necessary in view of the high pressure, as a shock from the leads is always unpleasant and often dangerous in the extreme. The method of converting from a low to a high voltage produces a current more or less alternating in character, that is to say, it flows first in one direc-

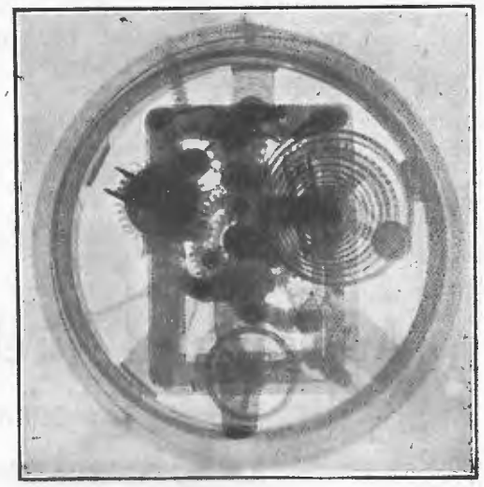


Fig. 3.—Radiograph of an alarm clock.

* The Editor would be pleased to receive accounts of early X-ray work, either from doctors or experimenters.

tion and then in another. Means have to be found to cut out the "inverse" voltage, and this is effected by introducing into the circuit a "valve tube" which offers a considerable resistance to the current flowing in one direction but very little to the "useful" current. In the case of the transformer the current is truly alternating, and in this case a disc revolving synchronously with the speed of the alternations is introduced into the circuit, and provided with contacts, arranged so that whichever way the current flows it is applied to the X-ray tube in one direction only.

Figure 1 shows the connections of a circuit when an induction coil is used to excite the tube. When the electrical impulses are applied to the tube the cathode particles (A) are driven against the focal spot (B), and X-radiation from this spot

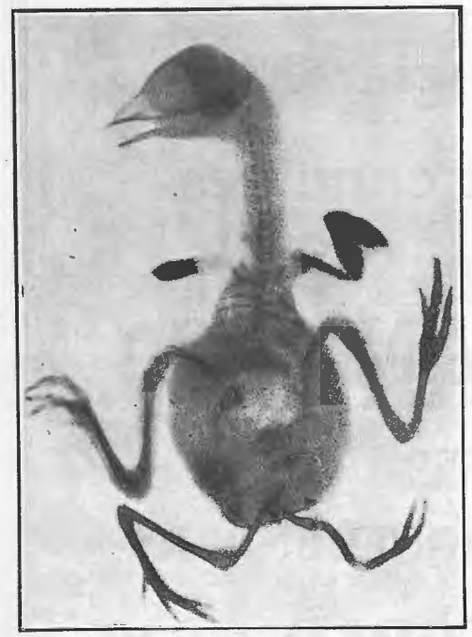


Fig. 4.—Radiograph of four-legged chicken.

takes place. The focal spot is situated on the anti-cathode (C)—sometimes called the target—and the emission of X-rays is caused by the minute negatively charged particles known as electrons coming into violent collision with a dense object. The higher the voltage applied to the tube terminals the greater the velocity of the electrons and the more penetrating the rays. In practice to-day voltages as high as 200,000 are applied to the tube terminals.

In 1913 Dr. W. D. Coolidge developed his now famous Coolidge tube, but from the time of the advent of X-rays until this date the science of X-rays was not marked with any startling discoveries. The introduction of this tube, however, called for powerful apparatus, and was largely responsible for the tremendous developments of recent years.

Applications of X-Rays.

X-rays behave in very much the same way as light rays. The chief difference between these two rays is that X-rays have a very much shorter wave length—about 5,000 times shorter—but in other respects are very similar. It is the shortness of the wave length that renders them invisible to the eye. We have said that they cast a shadow on a screen or photographic plate, and the public are generally aware of the use to which this phenomenon is put by the medical profession. They know that if the human body is placed between the focal spot of the X-ray tube and a specially prepared screen that the shadow of the bones and organs will be clearly visible. That the rays have curative effects in certain diseases is also common knowledge. It is only during the past few months, however, that the public interest has been aroused by the claims that X-ray photographs may now be taken of heavy metal objects. This progress in radiography in undoubtedly due to the development previously mentioned of the Coolidge tube in the laboratory of the General Electric Company of America. The principle of this tube is somewhat different to the ordinary X-ray tube. It is exhausted to such an extent that potentials of 100,000 volts, or even more, are not capable of causing the slightest current to pass. The cathode is provided with a spiral filament that lights in a manner similar to the ordinary electric light bulbs. When the filament is heated it emits electrons, and the tube is then capable of passing an electric current. The great advantage of this tube is that the degree of "hardness" can be varied to produce "soft" rays of small penetration to examine a delicate object such as the leaf of a tree, and of hard rays to examine

such a dense article as a piece of tungsten steel two inches or more in thickness. The hotter the filament the more readily does it emit electrons and the "softer" the tube. To heat the filament a small battery or transformer, to give about 12 volts 5 amps., is provided, and of course, provision is made to insulate the battery or the secondary winding of the transformer from "earth."

Figures 2 to 6 are all radiographs of various objects taken with the same type of Coolidge tube. It will be seen that by merely varying the heat of the filament it is possible with the same tube to radiograph such varied subjects as a newly hatched chicken, a steel plate, or the head of a 350-horse power aeroplane engine.

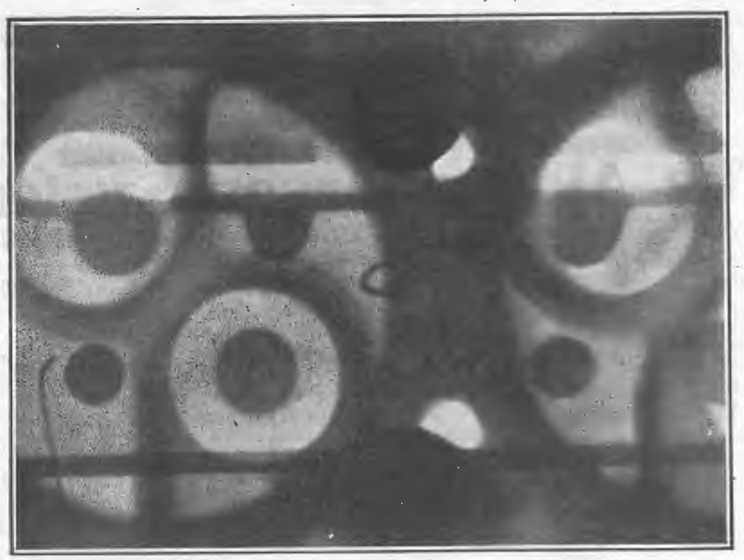


Fig. 5.—Radiograph of part of head of 350 horse-power aero engine.

It will be readily appreciated that the introduction of the Coolidge tube marked an epoch in the history of radiography. It made possible the development of a newer and better technique in regard to medical science, and brought X-rays into engineering and other industries. The workman making welded joints in steel plates or other metal objects, the exterior of which may appear to be perfect but the interior faulty, is now faced with a radiograph of his product, and asked for an explanation of its defects.

Radiographs in industry engender a competitive spirit, inasmuch as the workman cannot help taking a keen interest in the minute examination of his work, and takes a pride in the radiographic record of his craftsmanship. The manufacturer is able to ensure that the goods he turns out are free from defects, and is in many cases able to cheapen production and improve the quality of his work by the X-ray examination during various processes of manufacture. Not the least important factor is the moral effect on the whole *personnel* of an industry. The mechanic soon learns that the rays put a value on his stewardship, and the rays have not brains enough to make a mistake. The factory manager and foreman note just how the best and quickest work is obtained, and the advertising agent should not be slow in developing propaganda in regard to the improved methods.

The writer's attention was recently drawn to the practice of a large engineering firm of breaking every tenth article as a check on the quality of certain products. The cost of such a procedure is enormous. This firm is now negotiating for the installation of an X-ray apparatus to obviate the necessity for this waste.

In addition to the remarkable improvements in tubes and apparatus, mention

must be made of a new development in photographic plates that will not only be of very great value in medical work, but will be of enormous assistance in the examination of dense materials. The new plate is known as the "Impex," and was first described by the inventor, Dr. Leonard Levy, M.A. (Cantab.), F.I.C., and Mr. D. W. West, A.C.G.I., A.I.C., to the Rontgen Society, on December 16, 1920. It has been shown how rays affect screens coated with certain salts, and how they affect a photographic plate. For a long time it has been the practice to shorten exposures by placing a screen in close contact with the sensitive surface of the photographic plate. The X-rays not only act on the plate, but cause the screen to fluoresce, and this in turn is registered on the plate. The subject being radiographed casts the same shadow on both screen and plate, with a result that there is a double exposure of the same object, one being due to X-rays, and the other to the illuminated screen. In Dr. Levy's plate the fluorescent substance (calcium tungstate) is coated direct on to the light sensitive emulsion in such a manner as to be in the most intimate optical contact. When the rays fall on such a plate they affect the emulsion, and in turn the fluorescent salts, becoming illuminated, affect it; and furthermore, the salts emit a considerable amount of invisible radiation in the ultra-violet. The effect of the whole is a remarkable reduction in exposure. The use of this plate means that radiographs may be taken in one-twentieth of the normal time in the case of dense objects, or even one-thirtieth in lighter cases. The value of such a plate in the examination of metals where exposures are necessarily of long duration will result in the development of tremendously improved technique. Figures 2 and 3 show radiographs taken with this new plate.

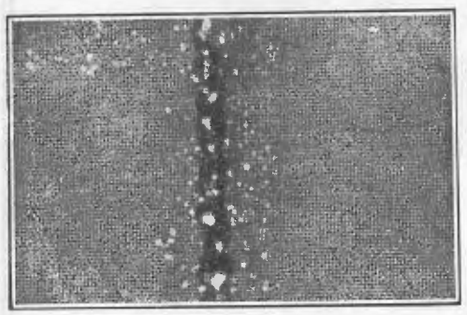


Fig. 6.—Radiograph of weld in metal steel plate.

The actual taking of a radiograph is not always necessary, especially in the examination of articles that are not very dense. These may be placed on an endless belt and caused to slowly pass the observer who views them as they pass a screen fixed in a light-tight box. Faulty goods are rejected or laid to one side for further examination or to be radiographed.

X-rays have proved of immense value in the study of physics, especially in regard to the atomic structure of crystals. The diffraction of X-rays by certain crystals enables the physicist to determine their formation. The work of Sir William Bragg and his son in this direction has received world-wide recognition.

Danger of X-Rays.

We have heard much during the past few months of the danger of X-rays, and no doubt in some cases individuals have avoided diagnosis and treatment owing to misleading press articles.

There is little or no danger to the patient. It is the operator in daily proximity to the rays who is most likely to suffer. The operator of to-day, however, is well aware of the danger and usually takes adequate precautions to ensure his protection. There have been admittedly a large number of deaths recently, but they were almost without exception due to damage done before the necessity of protection was fully appreciated.

It is interesting to note the method the specialist applying X-rays for treatment of certain diseases uses to measure the "dose" he can safely administer or desires to administer. Barium platinocyanide when exposed to X-rays undergoes a change in colour, and a special preparation of this salt is coated on a paper disc rather smaller than a threepenny piece. This disc is known as a pastille and placed at a measured distance from the target of the X-ray tube. During operation the pastille undergoes its change in colour gradually and when it corresponds to another colour known as the "standard," or "B" tint, the patient has received a "B" dose. An instrument called a radiometer is used.

to accurately determine fractional doses. The operator receiving more than a certain "dosage" will develop a skin reaction, and further exposure to the rays would mean an incurable dermatitis and, under certain conditions, predispose him to cancer or other malignant diseases, or even render him sterile.

The usual method of ensuring protection is to place some dense object between the target of the X-ray tube and the operator. The material used for this purpose is usually lead, or other substance with a lead content, such as lead-glass or lead-rubber. Nowadays not only is the tube itself usually protected, with only sufficient opening for the necessary emission of rays, but lead screens, lead-rubber aprons, lead-rubber gloves and even lead-glass spectacles are worn by the wary operator.

THE INVENTOR OF WIRELESS.

The following is an extract from a London journal:

To the Editor of the *Financial News*,

Sir,—I fear that the recollections of "Midas" in your issue of the 20th instant, regarding the invention of wireless telegraphy, would not be accepted by everyone as strictly accurate. Few matters of fact seem to have excited so much diversity of opinion. In France the majority of people are firmly convinced that wireless telegraphy is a production of French genius, as exemplified in Dr. Branly. In England "Midas" thinks the invention should be credited to Sir Oliver Lodge and Sir William Preece. In Russia, I daresay, partisans of M. Popoff could be found. In Italy I believe that almost unanimously the decision would be in favour of my being the inventor, and I have reason to think that in the United States there is what "Midas" might consider a regrettable tendency to follow Italian opinion. In Sweden, however, which may be considered a neutral country, since no Swede has yet laid claim to be the inventor of wireless telegraphy, the Nobel Prize Committee, which gives its decisions on the strength of an international vote, unfortunately ignored the claims of Sir Oliver Lodge and of many others and made their award in 1909 to me and Professor Braun, of Strasburg. Perhaps "Midas" has never heard of the latter gentleman.

"Midas" is also rather at sea when he states that the first instrument for despatching messages was exhibited by me at Dover Town Hall. This took place in August, 1899, and over a year before, in July, 1898, I reported the Kingstown Regattas by wireless from Dublin Bay to the *Dublin Express*. And before that wireless messages had passed between Osborne and the Royal Yacht, and before that again between warships of the Italian Navy.

Yours, etc.,
(Signed) G. MARCONI.

Marconi House,
Strand, London, W.C. 2.
July 22, 1921.

ELECTRIC MIRACLES.

The shipping board still loses money and also loses vessels, which simply disappear, through economy or pirates; as pirates are more frequently encountered than economy, the Captain Kidd theory is the one that prevails at the moment with Congress. My own impression, continues the writer in a London contemporary, is that ships perish owing to wireless electricity. This theory is suggested by the story of Captain Torrible, who has just returned from the river Amazon, where he was attacked by eels of high voltage in the alternating current. He calculates that there were forty watts per eel, and swears that at night his crew pulled out their pocket Bibles and were able to read them by electric light. Personally I have never seen sailors do this, but, as the ship's dynamos were short-circuited by the eels in the River Amazon, I will not dispute that the pocket Bibles were really perused. After all this is a New World.

[And there's a lot of New Stories.—ED.]

WIRELESS INSTITUTE OF AUSTRALIA

NEW SOUTH WALES DIVISION

A GENERAL MEETING was held at "Wireless House," Sydney, on Tuesday, September 13, at 8 p.m.; Mr. F. Basil Cooke, F.R.A.S., occupied the chair.

The Minutes of the previous Meeting were read and confirmed.

Two additional members were elected to the Council, *viz.*, Messrs. Whitburn and Gorman.

The following new members were elected:

Associate Member: Mr. R. A. White.

Members: Messrs. W. E. Gardner and W. J. Rowland.

Mr. Maclurcan outlined a proposed competition to be conducted in the near future, details of which will be published in *Sea, Land and Air* later.

The main business of the evening, a lecture by Mr. H. A. Stowe on "Alternating Current," was then entered upon. Mr. Stowe detailed his subject in a manner which made it clear to all present, and on the whole, without being too elementary, proved of such interest as to hold his listeners very attentively. At the conclusion of the lecture questions were answered concerning points brought out in the lecture.

The Honorary Secretary drew the attention of members to the circular sent around from the Postmaster-General's Department, concerning illicit wireless stations. All members of the New South Wales Division have been supplied with a complete list of all licensed experimental stations in New South Wales, and have been requested to notify the Hon. Secretary of any stations observed whose names do not appear on the list, as the Institute is determined to assist the authorities in every possible manner to overcome the nuisances caused by unregistered stations.

The new syllabus covering the period from October, 1921, to December, 1922, has now been completed and is in the press. All members will receive a copy early this month.

WEST AUSTRALIAN DIVISION

The ordinary Monthly Meeting of this Division was held at the rooms in "Warwick House," on Wednesday evening, August 24, the Vice-President (Mr. Vincent J. Matthews) presiding over a large attendance.

During the evening two lectures were delivered, and both proved very interesting.

The first entitled "Dynamos and Motors," delivered by the Honorary Secretary (Mr. T. F. Webb), was thoroughly appreciated by those present. The lecturer beginning with the elementary principles of alternating current motors, continued with the more technical details, and demonstrated the many virtues, defects, and idiosyncracies of this type of motor. The lecturer also gave a short discourse on the dynamo. As nearly every experimenter is influenced by the recent change to alternating current, this part of the lecture was most welcome, as it served to show the radio enthusiast how he could obtain a constant source of direct current which is so necessary in wireless work. The lecture was illustrated throughout by lantern slides.

The second lecture entitled "Electrical Hazards, Fire, and Accident," by the President (Mr. B. M. Holt), proved most instructive. By means of a large number of lantern slides, the lecturer was able to demonstrate the many dangers arising from faulty electrical installations. Examples were given of many of the causes of large fires.

The lecturer went on to detail almost incredible examples of carelessness in the use of electrical apparatus, and explained how large fires had been caused during past years in Perth and elsewhere. An example of a fire that was caused at one end of a block of buildings through a faulty installation at the other end, served to show that truth is stranger than fiction. This particular lecture represented the first of a series on the same subject to be delivered by Mr. Holt.

The Meeting accorded a hearty vote of thanks to both speakers.

The next General Meeting will be held on September 28, when Mr. Nossiter, of the Observatory, will give a lecture on "Time." This should prove most instructive.

SOUTH AUSTRALIAN DIVISION

The Third Annual General Meeting of the South Australian Division of the Wireless Institute of Australia was held at Alfred Chambers, Currie Street, Adelaide, on Wednesday, September 7.

A large attendance was recorded and the Secretary was complimented upon his efforts to make the meeting a success.

Mr. Honner occupied the chair; the office of President being vacant until the election of officers for the coming year, for which purpose the meeting had been convened.

The Minutes of the previous Meeting were read and confirmed, and the election of officers was proceeded with, the following being elected:

President: Mr. Hambly Clark.

Vice-Presidents: Messrs. J. M. Honner and H. Hawke.

Hon. Treasurer: Mr. R. M. Dunstone.

Hon. Secretary: Mr. C. E. Ames.

Hon. Assistant-Secretary: Mr. F. L. Williamson.

Council Members: Messrs. H. L. Austin, and W. J. Bland.

Examiners for Valve Licenses: Messrs. J. M. Honner, and W. J. Bland.

Librarian: Mr. R. M. Dunstone.

Library Committee: Messrs C. E. Ames, H. L. Austin, and K. J. Martin.

Auditors: Messrs. J. M. Honner, and K. J. Martin.

Four applications for membership were received; one applicant having travelled from Murray Bridge, a distance of over sixty miles, to be present at the meeting.

A presentation was made to the Secretary as a mark of appreciation of his services during the past year. The Secretary, in responding, stated that he had the interests of the Institute at heart and that he would continue to do all in his power for its welfare.

Mr. Hambly Clark, President, who later occupied the chair, drew the attention of members to a circular issued by the radio authorities, complaining of disturbances caused by experimenters using transmitting apparatus, and requested all members to report any breach of the regulations to the Secretary immediately. All such reports will be treated confidentially.

At the close of the business Mr. Dunstone delighted those present by reciting a chapter of "Ginger Mick," and as an encore gave a humorous description of a parson, and preached a sermon from "Old Mother Hubbard."

SPACE CHARGE

The Superintendent of the Marconi School of Wireless, Sydney, brought to our notice the definition of a "space charge," from Mr. G. Colton, a correspondence student of the school. As the definition is rather unique, yet entirely correct, we thought it would interest our wireless readers, and having obtained Mr. Colton's permission, publish same hereunder:

A "space charge" may be likened to a "bargain sale." The counter is the "plate," and each lady is an "electron," and is intent upon two things: (1) reaching the bargain counter (plate), and (2) keeping away or (repelling) the other ladies around her. This means that the crush immediately around the bargain counter (plate) is of such intensity that the "repelling" power of each lady (electron) is neutralised by those close by and the (electrons) ladies are close packed and hinder each other.

As one notices those further away from the (plate) bargain counter, it will be seen that although all are trying to read the (plate) there is proportionately more space between them, whilst the advertisement (filament) is still pushing more ladies (electrons) towards the bargain counter (plate) as fast as the compelling (incandescent) advertisement (filament) sets them off. They in turn help to "repel" those ahead towards the sale (plate).

In a soft valve. On the way the ladies meet friends (molecules of gas) and (*a*) negatively ionise them and they accompany the ladies (electrons) to the sale (plate), or (*b*) fail to convince them (positively ionise them), in which state the friend (positively ionised molecule of gas) rushes back to read the advertisement (bombard the filament).

The technical definition published in the 1921 edition of the *Year-Book of Wireless Telegraphy and Telephony*, reads:

Space Charge.—"The electric charge possessed by the electrons or positive ions situated in the vacuous space between the electrodes of a discharge tube or thermionic valve."

Place a standing order with your newsagent and ensure securing "Sea, Land and Air" regularly.

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

Revised to September 15, 1921.

SHIP.	OPERATOR.
Aeon	T. G. McEwan
Aldinga	——
Apolda	J. W. McKay
Arafura	C. W. Donne
Arahura	G. M. Gormlie
Araluen	H. H. Black
Aramac	——
Arawatta	——
Aroona	J. Doggett
Atua	——
Australbrook	——
Australcrag	S. J. McVeigh
Australford	H. G. Reilly
Australglen	H. A. MacDonald
Australmead	S. V. Blight
Australmount	G. Vincent
Australpeak	J. B. Ponsonby
Australplain	A. Stuart
Australpool	E. J. Glaisher
Australport	E. J. Giles
Australrange	E. F. Hayes
Bakara	G. Maxwell
Baldina	A. W. Hooper
Bambra	R. C. Williams
Barambah	M. L. Robertson
Barunga	H. E. Young
Bingera	F. L. Scott
Bombala	J. H. Hawkins
Boonah	F. A. Cook
Booral	T. V. Tressler
Boorara	T. Alexander
Bulla	R. T. Stephen
Calulu	R. C. Dymond
Canberra	H. W. Barnfield
Carina	V. E. Stanley (s) H. F. Tye (2nd) A. C. Hickey (3rd)
Ceduna	——
Changsha	B. Boni
Charon	J. E. Cleary
Chronos	P. Gillon
Cooee	A. W. Benn
Cooma	P. J. Manley
Delungra	W. Hill
Dilga	H. F. Giles
Dimboola	M. A. Prudence
Dinoga	H. W. Barnes
Dongarra	H. J. Byrne
Dromana	F. Stevens
Dumosa	R. J. Webb
Dundula	N. W. Marshall
Eastern	J. F. Hutton
Emita	W. Reithmuller
Enoggera	F. G. Lewis
Eromanga	A. H. Jeremy
Erriba	——
Eudunda	——
Eurella	F. Marsden
Flora	J. G. Henderson
Gilgai	A. S. Dening
Gorgon	I. R. Hodder
Hwah Ping	H. F. Hartley
Iron Baron	C. C. Ullman
Iron Monarch	A. D. R. Davis
Iron Prince	J. M. Camps
Kaiapoi	E. A. Miller
Kaikorai	J. A. Guy
Kaimanawa	G. Illingworth
Kaitangata	N. W. G. Scott
Kaitoko	W. S. Ringrose
Kaituna	W. A. Hawkins
Kaiwarra	L. A. Ternes
Kanna	K. H. McSwan
Kanowna	——
Karoola	R. R. Pilmore
Karori	M. Webb-Watts
Katoa	F. E. Duggan
Katoomba	W. H. George
Kauri	H. S. Chown
Kawatiri	R. R. Robinson
Kekerangu	R. P. Ginders
Kooringa	V. J. Foreman
Koromiko	——
Kowarra	H. Fullerton
Kurow	J. B. Gibson
Levuka	A. W. Watt
Loongana	——
Macedon	F. Ouvrier
Mackarra	S. L. Filer
Macumba	H. F. Harman
Maheno	G. H. Hugman
Makambo	J. A. Cooper
Makura	F. A. Hunter (s) G. Poole (j)
Malayan	——
Manuka	J. A. Heavey
Maori	R. S. Taylor
Mapourika	L. H. Jones
Marama	C. F. Griffiths (s) C. W. Drew (j)
Mararoa	W. C. Brown
Marella	W. H. Harris
Marsina	A. Cuthill
Mataram	C. H. A. Kidman
Maunganui	——
Melusia	S. F. Stafford
Merriwa	J. H. Pullen
Milluna	J. Overbury
Minderoo	J. G. C. Higgins
Mindini	R. Jordon
Moana	——
Moeraki	——
Mokoia	——
Monowai	——
Montoro	A. L. Dixon
Morinda	F. C. Davies
Nairana	T. Bannister
Navua	N. M. Leeder
Ngakuta	S. G. Bargrove
Niagara	W. J. Martin (s) E. W. Coldwell (j)
Ooma	A. E. Sheppherd
Oonah	F. G. Forrest
Paloona	G. M. Whiteside

(Continued on next page.)

(Continued from last page.)

Parattah	K. L. Simpson (s) E. C. Bouel (2nd) E. Pollard (3rd)
Rakanoa	G. Donnelley
Riverina	L. G. Devonport
Rotomahana	——
Saros	H. W. Warner
South Africa	S. R. Dixon
St. Albans	A. H. Beard
St. George	S. G. Jones
Suva	L. S. Lane
Tahiti	E. M. Bain (s) C. W. Taylor (j)
Taiyuan	J. H. Wilkin
Talawa	K. J. Dines
Talune	——
Tarawera	H. Kirk
Tofua	L. R. Dickson
Toromeo	M. Sedgers
Ulimaroa	H. Tuson
Victoria	R. H. Alexander
Waihemo	C. Williamson
Wahine	——
Waihora	E. A. Hunter
Waikawa	V. P. Nevins
Waikouiti	——
Waimarino	F. L. Dawes
Waiotapu	T. H. McWilliams
Waipori	M. H. Ryan
Wairuna	F. N. Davidson
Waitemata	D. W. Higgins
Waitomo	J. R. Gilligan
Wanaka	R. T. Murray
Westralia	D. N. Quinn
Whangape	A. O. Sutherland
Waingatui	J. H. Bennett
Wodonga	G. Pow
Woolgar	J. Glennie
Wyandra	F. Exon
Wyreema	W. H. Richardson
Yankalilla	W. C. Lucas
Zealandia	A. G. Ross

Amalgamated Wireless (Australasia) Operator Temporarily Attached to New Guinea Expedition.

Wattle	L. N. Callagnan

EXPERIMENTAL WIRELESS NEWS

A FEW years ago wireless enthusiasts of the Eastern Suburbs of Sydney formed the Waverley Amateur Radio Club. Like all other experimental wireless clubs and institutes, the Waverley Club had to "close down" during the war, but since Peace was signed and the restrictions imposed on wireless experimenters during the war relaxed, the club has again come to life and renewed its former activities.

At the present juncture there are only about twenty-four members who meet every Thursday evening in the club rooms at "Almont," MacPherson Street, Waverley. The club is progressing rapidly and the members, all keen enthusiasts, are obtaining very satisfactory results in their experiments. The club has been granted a transmitting licence and arrangements are being made to transmit wireless telephone messages under the supervision of Mr. Frank Geddes.

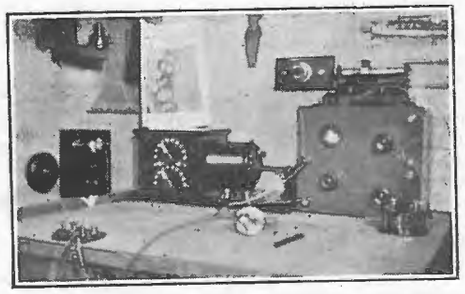
The small wall telephone at the side of the pigeon holes is connected to the wireless rooms of four other members of the club who live in the vicinity of Mr. Geddes' station, but it is hoped that this means of communication will be substituted by wireless telegraph or wireless telephone as soon as the authorities issue the necessary transmitting licences to experimenters

* * *

We also reproduce hereunder a photograph of Mr. Eric Bowman's experimental station at Bronte, N.S.W. (another member of the Waverley Amateur Radio Club), fitted with an "L" type aerial forty feet high and ninety feet long.

From left to right of photograph is seen the "B" battery switch, loose coupler and valve control panel, the latter accommodating an audiotron valve, two filament resistances and the secondary tuning condenser.

Receiving instrument at Mr. F. Geddes' station at Waverley, N.S.W.



Mr. E. Bowman's experimental wireless station at Bronte, N.S.W.

The photograph above shows the receiving station of Mr. F. Geddes, which is equipped with a two-wire "T" type aerial sixty feet high and one hundred and twenty feet long. From the centre of the photograph to the extreme right is a five stage amplifier. To the left is a Marconi plain tuner, another special 600-metre wave receiver, composed of honey-comb coils, Cunningham rectifying valve and a Marconi "VT" Class II. amplifier. With the exception of the filament battery, everything is contained in four cabinets; the instruments tuning to any wave length between one hundred and fifty and twenty-five thousand metres.

The primary of the loose coupler is fitted with tens and units tuning switches and two dead-end switches, thereby facilitating fine selectivity in tuning the primary circuit. The secondary is tapped to a six-point switch also fitted with two dead-end switches.

Every part of this receiving set was made by Mr. Bowman, who deserves great praise. He states that he can pick up without the slightest difficulty all Australian and New Zealand coast stations at any time they are working, as well as many ships hundreds, sometimes thousands, of miles out on the high seas.

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Edited by S. E. TATHAM.

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

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