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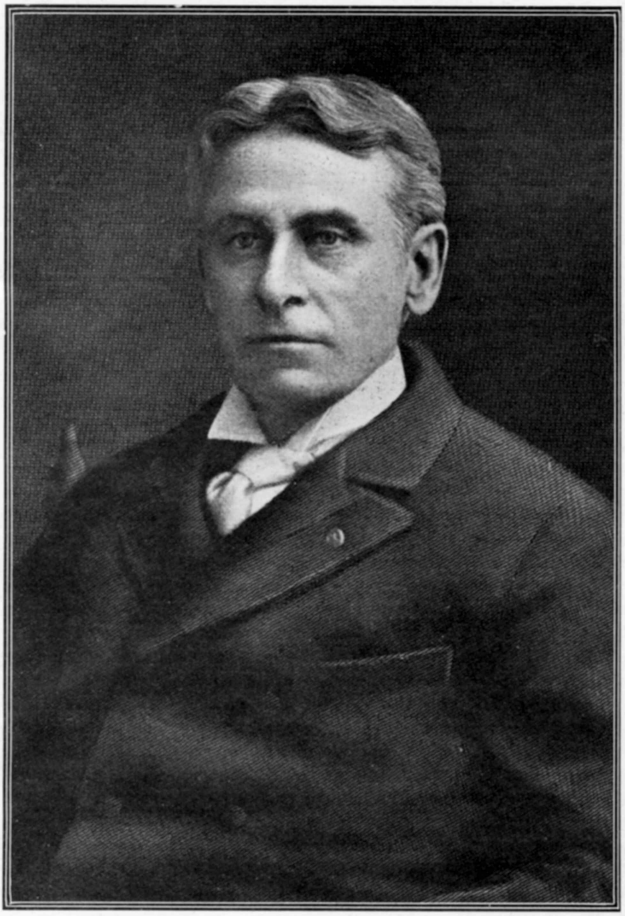
Wireless in Two Hemispheres

THE contract entered into with the Italian Government for the erection of a 60-k.w. station in the vicinity of Rome, on a site selected by the Italian Admiralty, is one of considerable interest and importance. The building, masts, and material are being supplied by Marconi's Wireless Telegraph Co., Ltd., the erection of the masts being carried out through the intermediary of the Italian Agency. Six towers in iron and wood of the Coltano type are being erected, two each being 75 metres high and the remaining four each of 45 metres in height. These will support a multiple wire T aerial of a total length of 360 metres; the surface occupied by the aerial will be about 14,000 square metres. The Italian Government are erecting the building, which will contain engine, power, battery, and operating rooms, stores, waiting and staff rooms, and the necessary adjuncts. In the engine room, which will have a floor space of 32 ft. by 25 ft., there will be installed duplicate 50-b.h.p. Diesel oil engines, each driving, by means of a belt, a 30-k.w. continuous-current dynamo which were specially designed. Two 32-k.w. low-frequency inductances will be provided for regulating the frequency of the discharge circuit to the value necessary for the number of sparks adopted, and, in addition, two 32-k.w. high-tension transformers will be installed to transform the alternating current by the group of generators to the required voltage for the condensers. The receiving apparatus will consist of a valve receiver adapted to receive all words comprised between 2,650 and 6,500 metres. In addition to the valve receiver, a magnetic detector will also be furnished. The station is to test to Poldhu, and will have a normal power of 32 k.w., and overload up to 100 k.w. The exact arrangement of the plant for this overload has not yet been determined.

The Agreement entered into by Marconi's Wireless Telegraph Co., Ltd., The Marconi Wireless Telegraph Co. of Canada, Ltd., and The Marconi International Marine Communication Co., Ltd., on the one hand, and the Canadian Government on the other, marks an important stage in the commercial development of wireless telegraphy. Under this agreement the Marconi companies undertake to transmit general messages between stations on the Atlantic coast of Canada and corresponding stations on the coast of Great Britain and Ireland at not more than 10 cents per word for such messages, which is fully 60 per cent. less than the rates now charged for cablegrams across the Atlantic, the rate for the latter being 25 cents per word. This should be borne in mind by commercial and other interests on both sides of the Atlantic, who are constantly complaining of the oppressive rates charged for telegraphic communications between Great Britain and Canada. But this is not all, for not only will Press messages be transmitted at a shore-to-shore rate not exceeding five cents per word, but messages in connection with weather conditions and forecasts, tide conditions, ice, and reports on aids to navigation will be transmitted at that rate. The Montreal and Three Rivers Stations pass into the possession of the Government for a substantial consideration, and the Marconi companies undertake to maintain and operate the Government-owned wireless stations known as Cape Race, Point Rich, Belle Isle, Cape Ray, and Point Amour in Newfoundland, and Heath Point, Fame Point, Clarke City, Father Point, Harrington, Montreal, and Three Rivers, in the province of Quebec; Cape Sable, in the province of Nova Scotia; and Partridge Island in the province of New Brunswick. This contract remains in force for twenty years.



GOVERNOR JOHN W. GRIGGS

Governor John W. Griggs

President of the Marconi Wireless Telegraph Company of America

PERHAPS no type of the human species is so susceptible to the sweet uses of publicity as is the politician. Yet, if the truth were known, it would probably be found that even the politician is prone to shun too much publicity, in the belief that it has the effect of embarrassing and retarding rather than quickening the operation of his mind and the development of his plans. After all, it is not helpful to a man to have constantly to dress his mind to suit the public eye, and still less to undress it in public as politicians are so often forced to do.

Governor John W. Griggs has lived a long and strenuous career, and had attained positions of dizzy eminence in the practice of the law and in the public affairs of his country before turning his attention to business and lending his mature talents for the development of the Marconi interests in the United States of America. He was born sixty-two years ago in the State of New Jersey, and after a successful, if somewhat uneventful, scholastic career, he prepared himself for the legal profession, and eventually became a member of the Bar of New Jersey and New York, and of the Supreme Court of the United States. To his undoubted talents he added keen intellectual perception, untiring energy, and infinite capacity for work. It is no surprise to find, therefore, that the engrossing labours of his profession did not diminish his interest in the welfare of his country, and that he was able to find time to render excellent service to the State. When the opportunity arose Mr. Griggs was at hand to make the most of it. It is recorded in the pages of English history that great things have been done by men who made most of the occasion; men possessed of insight as well as foresight, who were gifted with the faculty of deciding how much was possible, by attempting that and not something else. That, if we may term it so, is the positive side of judgment—the facility of setting before oneself an object of attainment—which Mr. Griggs early in his public life showed himself capable of to a wonderful degree. But he was not lacking in the negative side of judgment, which we might say is to avoid making mistakes in the object set before one.

For eight years Mr. Griggs was a prominent member of the Legislature of New Jersey, and in 1895 he was chosen as Governor of that State. Henceforth known by the designation of Governor Griggs, he was to be made the recipient of still greater honour and responsibility. In 1899 he was appointed by President McKinley a member of the Cabinet, holding the portfolio of the Department of Justice as Attorney-General. He was one of the chief councillors of President McKinley during the period that comprised the Spanish war, the insurrection in the Philippines, and the Boxer rebellion in China, and while Attorney-General he argued many cases of great importance for the Government in the United States Supreme Court. In all these rôles, whether as councillor, statesman, or advocate, he displayed sagacity and sobriety of judgment, and to these natural gifts the fairy godmother added tact—a quality which perhaps flourishes somewhat sporadically.

Governor Griggs resigned the office of Attorney-General in April, 1901, in order to resume the practice of his profession. Since then he has held no public office. But it is not to be supposed that any country can forego altogether the services of a man who had shown a judicial or statesmanlike faculty of detachment that enabled him to see both sides of the question, and it is no surprise therefore that even after forsaking public life he consented to become a member of The Hague Court of International Arbitration.

He became a director of the Marconi Wireless Telegraph Company of America, and in 1905 was appointed President of that Company. Truly, he answers the poet's riddle of life:

"To know, to do, and on the tide of time
Not to drift idly like the cockle-sailor,
Whose pearly dances on the blue,
But to steer onward to some purposed haven
And make new waves with motion of our own."

At the Royal Investiture.

An interesting instance of the various uses to which wireless telegraphy can be put was provided by the employment of two Marconi portable wireless telegraph sets at the recent Investiture at Carnarvon of H.R.H. the Prince of Wales.

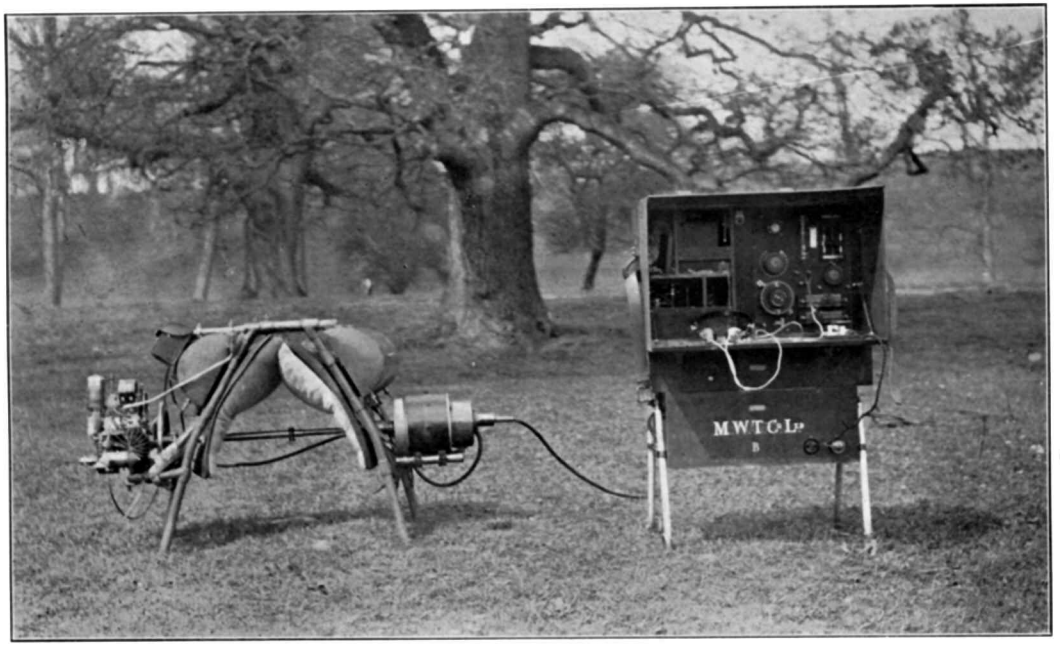
The two stations in question, which are of the Marconi's Wireless Telegraph Co.'s standard cavalry type, are the property of the Westmorland and Cumberland Yeomanry, commanded by Lieut.-Col. Claude Beddington.

The stations are similar to those recently employed on the demonstrations in Turkey and Spain, and have been specially designed by the Marconi Company to be capable of easy and rapid transport and to afford a means of communication between cavalry or other mounted units and the main body. Owing to the rapidity with which these portable sets can be erected and dismantled, the whole process lasts only a few minutes, and they are consequently of the greatest value from the military point of view. It is satisfactory to report that these sets have been spoken of in terms of the highest praise by the above-mentioned regiment, by whom they are employed regularly on all manœuvres.

The two portable stations accompanied the Westmorland and Cumberland Yeomanry to Carnarvon, to which place the regiment had been ordered for the Investiture ceremony.

One of the stations was erected in the neighbourhood of Carnarvon Castle itself, the second being situated in the vicinity of the headquarters camp, and by means of these two installations constant communication was established between the Royal yacht and the units of the fleet and the shore. Communication from the Carnarvon Castle installation was also established with the Government station at Liverpool and with the headquarters camp.

Constant communication was maintained between the Royal yacht and Carnarvon Castle by means of the Marconi system of wireless telegraphy. A respectful message of congratulation was sent from Poldhu by Mr. Marconi to the Prince, who graciously acknowledged this message from his yacht, also by means of wireless.



A Marconi Cavalry Pack Set, comprising Engine and Dynamo, Transmitting and Receiving Apparatus.

"There is big work yet to be done, and the Company intend to do that work." This statement is culled from the speech of the managing director, Mr. Godfrey C. Isaacs, at the annual meeting of Marconi's Wireless Telegraph Co., Ltd.

Energy Losses in Condensers

In apparatus for radio-telegraphy on the spark system the oscillations are created by a discharge of a condenser, and the efficiency of the transmitting apparatus will therefore be affected by any energy losses in the condensers used. It is sometimes assumed that these energy losses are negligible, and that the chief sources of energy dissipation in the transmitter are the spark resistance and the high-frequency resistance of the circuits. This, however, is not the case, and it is necessary to provide some arrangement for the purpose of measuring the internal energy losses in condensers traversed by high-frequency currents. Such an arrangement of apparatus was described by Dr. J. A. Fleming and Mr. G. B. Dyke before a recent meeting of the Physical Society.

Dr. Fleming and his *collaborateur* have shown that these energy losses in condensers may be considered as if they were due to a resistance loss in a hypothetical resistance in series with the condenser, the condenser itself being supposed to have a perfect non-dissipative dielectric of the same dielectric constant. This hypothetical resistance is not constant, but is a function of the condenser current. The experiments were conducted by the use of a special form of impact discharger, comprising two flat plates immersed in oil, one stationary and the other revolving at a high speed. This discharger was placed in series with a primary circuit and condenser, and high-frequency oscillations were set up in the primary having any desired frequency. A secondary circuit loosely coupled consisted of a wire whose high-frequency resistance could be determined, the condenser to be examined and a hot-wire ammeter and variable resistances. The measurements consisted in observing the reading of the ammeter, and then changing the current created in the secondary circuit by a small amount by adding a known resistance which altered the decrement of the circuit, but not its inductance. From these readings an equation was obtained for the hypothetical condenser resistance. It was shown that the product of the square of the secondary current A^2 and the total resistance R of the secondary circuit was constant, and hence that the unknown condenser resistance p could be found from observations of the change in A^2 when an additional resistance r_1 was interpolated in the condenser circuit. The energy loss in the condenser was then A^2p watts. Condensers, with various dielectrics, air, oil, glass and ebonite, were examined, and the dielectric energy losses D were stated in micro watts per cubic centimetre of dielectric for given values of the electric force E. It was shown that D could be expressed as a function of E in the form $D = XE^{\gamma}$, where X is a constant depending on the current density and γ is a constant depending on the nature of the dielectric. For oil and air these power losses were relatively small, but for glass and ebonite large.

In the course of the experiments referred to above a large number of measurements had to be made with the cymometer of the frequency of oscillations in, and the inductance of, the secondary or condenser circuit. It was then an easy matter to draw complete resonance curves in each case and this was accordingly done with both the impact and spark ball dischargers in the primary circuit and for various resistances in the secondary circuit. The results are interesting, as showing exactly what takes place in each case in the primary circuit. If the spark ball discharger is used, and if the primary and secondary circuits are coupled with various degrees of coupling, then, for any close coupling, it was found on the resonance curve that there were three peaks corresponding respectively, as regards frequency, with the free oscillation period of the secondary and with the two-period oscillations set up by the reaction of the secondary upon the primary circuit. As the coupling was weakened the double-period oscillations died out, and only the free oscillation of the secondary survived. There was always a certain coupling, not far from 10 per cent., which gave the maximum current in the secondary circuit in the form of a free oscillation. If the secondary circuit were more highly damped, then the two-period oscillations would be more strongly marked, and the maximum free period oscillation would have a lesser maximum value.

By using an impact discharger the double-period oscillations were only apparent when the coupling exceeded about 30 per cent., and died away with a very little reduction in the coupling, leaving the predominant free secondary oscillation as the survivor. These curves showed how very quickly the primary spark was quenched when using the impact discharger. If the maximum secondary current were set up as ordinates in terms of the coupling as abscissa curves were obtained which rose up quickly to a maximum value and fell again, and which indicated that the maximum value of the secondary current was determined both by the coupling and the secondary decrements.

"By Marconi wireless telegraph through the ether Lord and Lady Kelvin send warm thanks to kind friends, electric and not electric, who made their three weeks' visit to America most interesting and delightful."—From the late Lord Kelvin, off Nantucket, on board the "Lucania," May 12, 1902.

The New Greek Naval Marconi Station at Athens

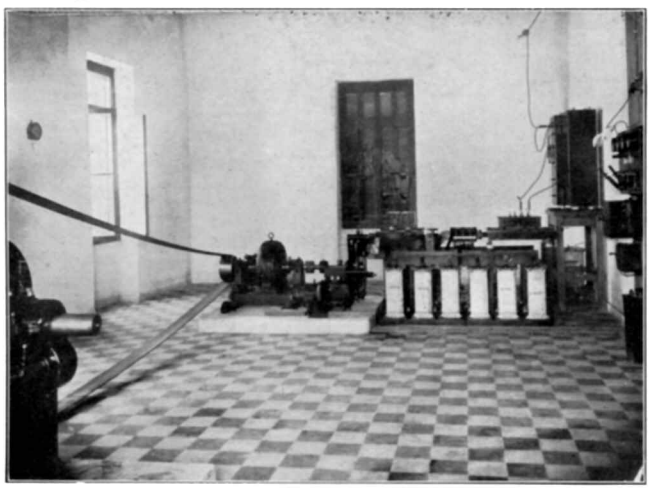
BY F. E. WATTERSON

WHEN, three thousand years ago, King Ægeus, watching from his rocky promontory with anxious eyes for the return from Crete to Greece of the ship returning with his son Theseus from the expedition against the Minotaur, saw the melancholy black sail of death instead of the expected emblem of victory, the aged monarch threw himself into the sea in despair and perished. If King Ægeus had lived to-day he would merely have shown a little peevishness at the pilot's carelessness in forgetting to hoist the white signal; for the news of the slaughter of the Minotaur would have been received from the great Marconi station which has been completed almost under the shadow of the Acropolis at Athens.

This station, one of the most up to date in the world, stands in latitude 37deg. 58min. N., longitude 23deg. 44min. E., upon a rocky promontory, commanding superb views of ancient and modern Athens and the Attic Plain, whilst across the sparkling waters of the beautiful Bay of Phaleron lies the rugged coast of Salamis, where in 480 B.C. Xerxes watched the destruction of his fleet by the Athenian navy.

Panorama of Athens, with Mount Lykabettos in distance. Looking north from the Marconi Station.

The building is of crystalline limestone in the modern Greek style of architecture, and contains a spacious machinery hall, receiving rooms, land-line and other offices for the



The Machinery Hall.

handling of radio-telegraphic business. There is also a library and officers' quarters, with accommodation for fifty petty officers and men, and a wireless training school. The station is in charge of Lieut. Athaniasiades, of the Greek navy.

The antennæ, which have been designed to give a maximum radiative effect in every direction, are led from a central mast, 200 ft. high, to four masts forming the corners of a square of 566 ft. Two aerials are provided, one for communications up to 1,000 miles on waves varying from 1,200 to 4,000 metres, the other for communications on 300 and 600 metre waves, in compliance with the regulations of the International Radio-telegraph Convention. Changing over from one aerial to another is accomplished instantaneously by means of an automatic switch.

Numerous engineering problems connected with the erection of the station and the installation of the apparatus had to be faced. To begin with, 5,000 tons of rock were blasted away in levelling a site for the station, and 30,000 ft. of wire were used as leads to the circle of galvanised iron plates 3 ft. below the surface which comprises the earth.

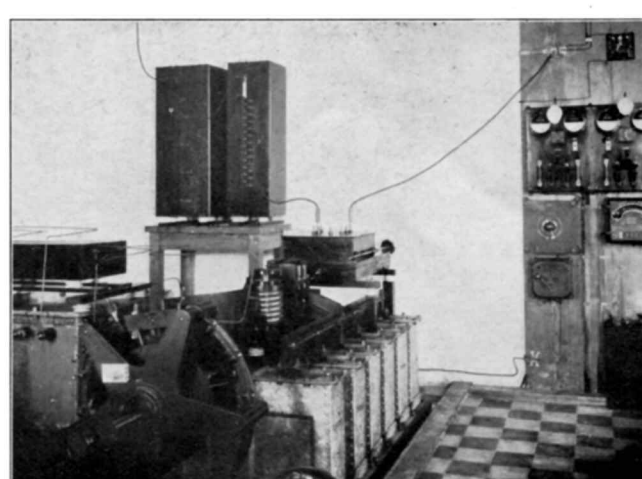
Ordinarily, current from the Piræus mains at 440 volts is supplied to the rotary converter; but for emergency purposes a 20-horse-power petroleum engine has been provided. The cases containing the parts of this engine had an eventful journey from England to Athens, for by some means they were upset into the sea at Piræus. After being fished up from the bottom of the harbour, a local contractor undertook to convey the cases to Athens, but so great was the weight of these parts that it was not until the unfortunate contractor had suffered immense damage to his transport carts that the parts were finally brought to their destination.

The power-plant consists of a 15-k.w. converter, coupled directly to a new type of rotary spark-gap, the outer electrodes of which are adjustable by a rocker to the lag and lead of the low-tension alternating current. By this means a pure musical note is given to the spark, free from undertones, in order to overcome the effects of the electrostatic discharges which prevail locally.

Adjustable couplings are, of course, provided in the oscillation transformers at this station, and as these permit of a wide range of couplings being made between the oscillating circuits, very highly defined waves can be obtained, with sharp tuning possibilities.

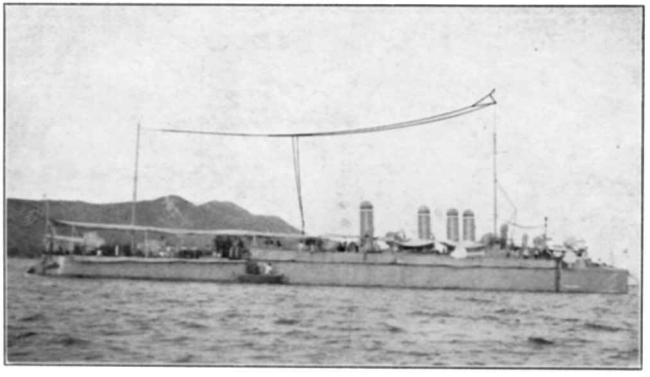
The condensers consist of a bank of twelve standard whole-plate units, and by means of a special commutator the capacity can be varied instantly.

Signalling is done in the generator circuit by means of a Morse manipulating key, which



The Rotary Spark Gap, Oscillating Transformer, and Inductances.

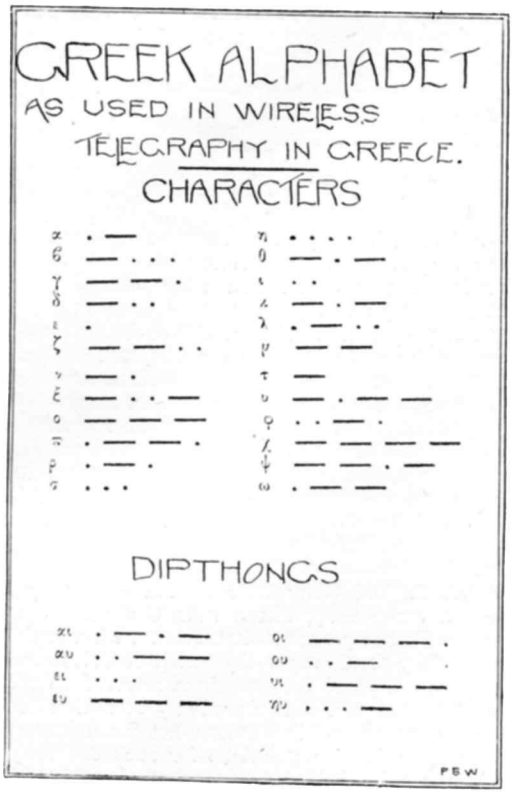
controls a high-tension magnetic switch-key placed in the secondary circuit of the transformer, the actual make and break taking place in forced draught produced by a motor-blower which quenches the arcs formed at the instant of contact and disconnection.



A Greek Destroyer. View showing the Aerial.

An important feature of the Athens installation is the means whereby the operator can be interrupted by the corresponding station whilst despatching a message. This is done by having both the receiving and transmitting instruments always connected to the aerial, through an "earth-arrester" with an automatic telephone short-circuiting device. But perhaps the chief advantage of the "earth arrester" is that it obviates the necessity of shutting down the alternator whilst receiving, thereby saving a great deal of time as well as wear and tear of the machinery occa-

View from the north-east of the Station. The Acropolis, with the Temple and Nike Apteros (the Wingless Victory) to the right.



sioned by continual shutting down and starting up of the motors.

The receivers comprise the magnetic detector with multiple tuner, a filings coherer and Morse recorder being provided for stand-by purposes.

It is intended by the Greek Government that the Athens station shall handle public traffic to and from the great ocean liners which pass through the Mediterranean sea on the Orient route.

As will be seen from the above illustration, the combination of dots and dashes used to designate the Greek alphabet differs greatly from the signals of the international Morse code. Much study and long practice is required before Greek telegraphists become proficient in sending and receiving messages in Latin characters.

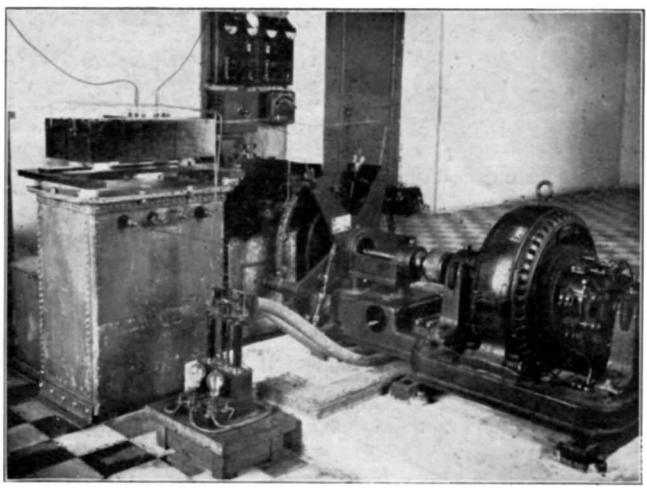
The Greek destroyer flotilla of eight units has been recently equipped with standard Marconi 1½-k.w. sets. The Royal yacht "Amphitrite" is also being fitted, whilst on board the new battleship "Georgius Overof" a 10-k.w. set of apparatus has been installed. Mr. A. B. Blinkhorn is the Company's engineer in charge at Athens, and he is assisted by Messrs. Rice and Watterson.

As a rule Marconi engineers are not much given to day-dreams, though why it is difficult to say, because is not the development of radio-telegraphy as poetic as the sweetest day-dream? But even the most matter-of-fact engineer cannot fail to be impressed by the sight of the station at Athens, which conjures up the most startling contrast of modern scientific enterprise with all that is most ancient in the history of civilisation.

The sun is setting behind the hills as I write these lines. Mount Dionysis stands out violet in the clear evening air, and the last rays of golden light falling on the Acropolis throw into relief Doric pillar and Corinthian column, and shine on pediment, architrave and entablature.

Through those marble portals have passed in solemn procession the world-conquerors of old, whose empires have vanished, whose cities are dust, Darius, Xerxes, Philip of Macedonia, Alexander the Great, Æmilius Paulus—their names echo and re-echo down the long aisle of centuries.

Now, 2,000 years after, come men from the north and speak through space to continents and islands across the sea. And the same statues of the maidens on the temple at Athena that heard the sweet songs of Sappho and the speeches of Socrates and Demosthenes and witnessed St. Paul led out in chains to die, smile down in changeless silence on the network of gleaming Marconi wires through which the spirit of Progress manifests itself to-day.



The Transmitting Apparatus, showing Rotary Spark Gap, with H.T. Signalling Key in foreground. Pipes convey the air blast to the contact.

The Preparation of Weather Forecasts
How Wireless Aids Meteorology

MANY a light, hailed by too careless observers as a fixed star, has proved to be only a short-lived lantern at the tail of some newspaper kite. That scientific heaven which is sometimes dotted with rival glories is found to have been a stage sky merely, artificially illumined from behind; and the cynical daylight which invariably follows all theatrical enthusiasms shows up ragged holes where once were luminaries; sheer vacancy instead of lustre. It seems but yesterday that wireless was hailed as a new star in the firmament, whose brilliance attracted universal attention. But the wiseacres shook their heads incredulously and adopted the "wait and see" attitude; interested parties to whom the advent of wireless meant a very serious thing ran about with Diogenes dark-lanterns professing to see a failure but inwardly smitten with fear. Those who have waited now see achievements for which they had hoped but had not dared to expect, and although young, the history of radio-telegraphy is written imperishably on the face of the world and in characters as beneficent as they are enduring.

Of the services rendered by wireless telegraphy to various objects one of the least known, but by no means the least important, is the aid which it furnishes to meteorology. When the holiday maker is about to seek a brief relief from the toil and stress of a busy city life, or when the enthusiastic amateur gardener desires to cultivate a certain growth, his thoughts naturally turn to the weather. The forecasts and isobaric charts issued by the Meteorological Office are useful guides as to the state of the weather, despite the cynics who find that the official forecasts often go by contraries. In 1868 a series of important charts were published representing by isobaric lines the distribution of the mass of the earth's atmosphere, and by arrows the prevailing winds over the globe for the months and the year. By these charts the movements of the atmosphere and the immediate causes of these movements were for the first time approximately stated, and some knowledge was thereby attained of some of the more difficult problems of meteorology. It was shown that the prevailing winds are the simple result of the relative distribution of the mass of the earth's atmosphere: in other words, of the relative distribution of its pressure, the direction and force of the prevailing winds being simply the flow of the air from a region of higher towards a region of lower pressure, or from where there is a surplus to where there is a deficiency of air. It is on this broad and vital principle that meteorology rests.

The preparation of these charts is largely dependent upon telegraphic reports from different regions. Until the advent of wireless, however, large regions were left untouched, and instead of possessing precise data from such regions as is now available by means of Marconi wireless telegraphy, the Meteorological Department had to depend upon empirical data, which, as we all know, is entirely unsatisfactory. So important had the subject of wireless weather telegraphy become, that at the meeting of the International Meteorological Committee in Paris in 1907 it was agreed to appoint a new Commission to deal with all questions connected with weather telegraphy and especially with wireless telegraphy. One of the questions referred to this Commission was the advisability of each member urging upon his Government "the importance of national regulations for such control of wireless telegraphy as will compel each ship licensed to carry wireless instruments to take and transmit meteorological observations, also to transmit to other ships or to stations on shore all observations received."

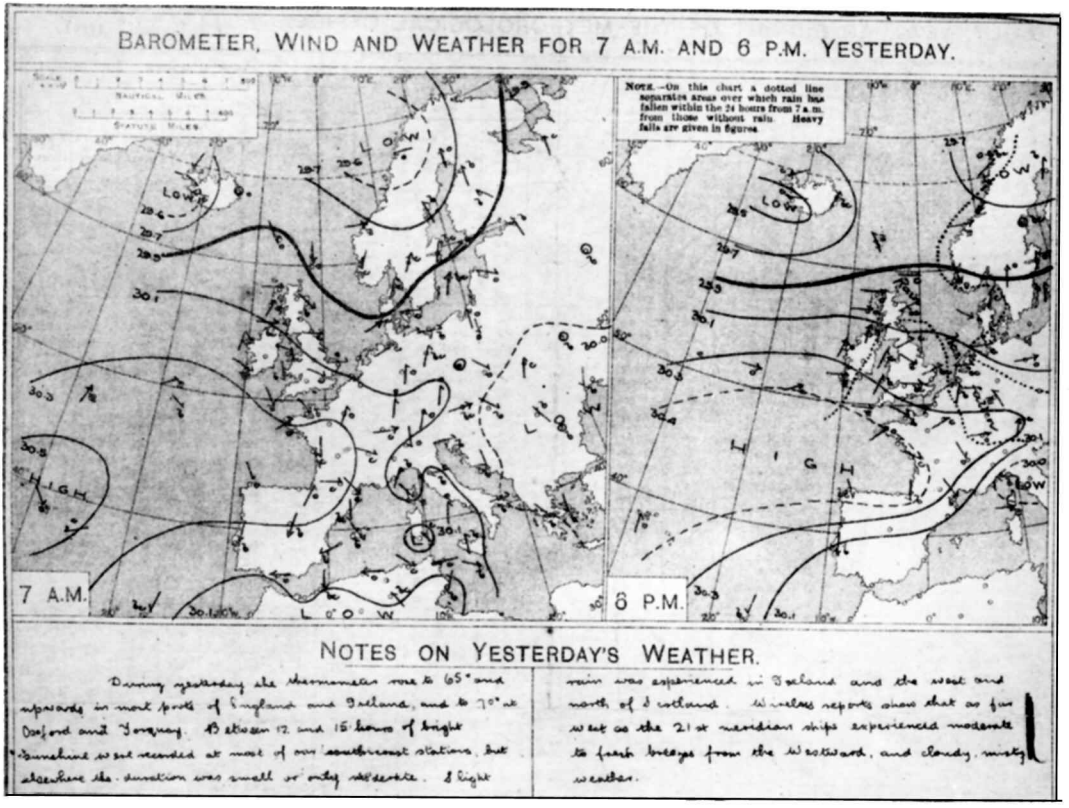
This question formed the basis of discussion at a meeting of the Commission held in London in June, 1909, over which Dr. W. N. Shaw, the Director of the British Meteorological Department, presided. At that meeting Dr. Shaw reported that he had received a communication from the Director of the Prussian Meteorological Institute asking whether a representative of the *Reichsamt des Innern* could attend the deliberations of the Commission with respect to Wireless Telegraphy, and that a similar inquiry had been received from Dr. Polis, Director of the Meteorological Observatory at Aachen. To these replies had been sent to the effect that the Commission would doubtless be glad for the gentlemen indicated to attend the meeting at which reports respecting radio-telegraphy would be received, in order that the information at the disposal of the Commission might be as complete as possible. Dr. Polis accordingly came to London for the purpose of attending a meeting on Tuesday, June 22nd, and was invited to be present at meetings for the discussion of the subject of radio-telegraphy. Commander E. Simpson, Naval Attaché to the American Em-

bassy in London, was also invited to attend the meeting on June 22nd, to give information about arrangements for radio-telegraphy on the American coasts.

Dr. Shaw reported upon some experiments on the transmission of wireless telegrams from the ships of H.M. Navy which commenced on January 23rd, 1907. The experiments were conducted under very favourable circumstances, and were found to give very satisfactory results, both as to the distance of transmission and the accuracy of the observations. Reports to the British Meteorological Committee on the service for the months of February and March were read, is of the opinion that the transmission of reports by radio-telegraphy for meteorological purposes from ships must still be regarded as being in the experimental stage.

If an estimate of the ultimate value of the wireless reports for forecasting had to be based upon the immediate utility of the reports received in the tests conducted up to the present time, it would be difficult to present a strong case. But in view of the fact that in individual cases wireless telegraphy might prove of great importance, and that the efficiency and promptitude of the service may be expected gradually to improve, the Commission would urge further trial of the service, and looks forward with satisfaction to a renewal of the experiment by the German and British Offices in the current year.

The experiment continued, and a record of their



from which it appeared that out of 469 messages received in February 4·5 per cent. arrived within two hours, 16·4 per cent. within 24 hours, 20·5 per cent. within two days, and 58·6 after two days. The corresponding figures for March were, out of 672 messages, 4·7, 18·0, 24·0, and 53·3 per cent. respectively. Finally, the following resolutions were agreed to :—

That the work done by the German and the British Offices in inaugurating a system of wireless observations at sea has accomplished results that merit favourable consideration.

In view of the test made by those Offices, and earlier by the United States Weather Bureau, the Commission

subsequent success appears with convincing clearness in the annual reports of the Director of Meteorology in other publications. Reports of daily observations at 7 a.m. and 6 p.m. have been transmitted by wireless telegraphy for three years. These records are much valued, and are placed on the working charts with the same confidence as are those from land stations.

Much more could be written concerning the historical development of the application of wireless to meteorology, but we have said enough to demonstrate the wonderful progress recorded. It now remains to examine results,

and this we can best do by taking the year ended March 31st, 1911.

We find during that period 89 wireless messages were sent by ships of H.M. Navy; 32 other messages were delivered in time to be included in the issue of the Meteorological Office daily weather report for the same day. In the course of the twelve months ending with March of this year, 3,955 wireless reports were sent from Atlantic liners. The numbers in the several months ranged from 404 in May to 214 in December and January. The number of messages is somewhat lower than the corresponding figure for the twelve months ending March, 1910, viz., 4,388. This is to some extent due to the fact that in the middle of May, 1909, onwards, messages which reached the shore receiving stations more than 48 hours after the hour of observing were sent on to the Meteorological Office by post. Only 3·4 per cent. of the messages reached the office in time to be included in "to-day's" map of the Daily Weather Report—*i.e.*, within four hours of the time of taking the morning observations; 39 per cent. of the messages reached the office in time to be included in one of the two maps for "yesterday" shown in the Daily Weather Report (see illustration on p. 11).

It is possible to cite a number of occasions on which the wireless messages were of great assistance to the forecaster. Thus, on January 28th, a message which came to hand about noon showed that at 7 a.m. on that day a deep depression was in existence at some distance to the west of Ireland. Storm warnings were issued immediately to the west coast of Ireland, and in the course of the evening or night strong gales were experienced there. Again, on the evening of Sunday, March 5th, two wireless messages were received as the forecasts were being drawn up. This revealed very clearly the V-shaped character of the depression then lying off the western coast of Britain which was not evident from observations at land stations. The forecasts for all western districts were notified in consequence, and proved to be accurate.

The wireless messages have also been of great service in connection with the issue of the modifications of spells of settled weather. In this connection messages which take a considerable time in transmission may still be of use if they show that there was no serious disturbance in existence over the Atlantic at the time when the observation was taken.

A word remains to be said now as to the means which produce such valuable results. Arrangements have been made for radio telegraph messages to be transmitted from 74 ships in the Atlantic. The hours of observation are 7 a.m. and 6 p.m. The observations to be signalled are: (1) The reading of the barometer at a fixed hour to the hundredth of an inch; (2) the wind direction and force at the fixed hour; (3) The fixed hour, and the state of the weather at the fixed hour; (4) the reading of the barometer, wind direction and force three hours before the fixed hour of observation. So long as the ship is between longitude 10° W. and longitude 30° W. a message should be sent regularly, (1) at 7h. 5m. a.m. G.M.T. reporting the observations at 7 a.m. G.M.T. with the control observations of 4 a.m.; and (2) at 6h. 5m. p.m. G.M.T. reporting observations at 6 p.m. G.M.T. with the control observations of 3 p.m.

The Marconi Company have arranged for the transmission from ship to ship of the messages sent when a ship is outside her own range from the shore station. If communication with shore has not been established within 48 hours of the time of observation, the messages will be forwarded by mail and not by telegraph. When the ship is between longitude 10° W. and 15° W. a message should be sent reporting observations at 1 p.m. with control observations at 10 a.m., if the position of the morning or evening observations be unfavourable on account of being beyond range of the shore station.

The following is an example of the information compiled for the message reporting an observation at 7 a.m. G.M.T., the control observation having been made at 4 a.m. G.M.T.:—

Address	Day of the Month	Position at 4 a.m.	Barometer at 4 a.m.	Wind direction and force at 4 a.m.
Meteorology	31	Long. 15°W. Lat. 51°N.	30·02	S.W. 6
Coded as, Meteorology	31351		00257	

Position at 7 a.m.	Fixed hour of Observation	Weather at 7 a.m.	Barometer at 7 a.m.	Wind direction and force at 7 a.m.
Long. 16°W., Lat. 51°N.	7 a.m.	Overcast	29·97	S. 7
36174			99745	

Wireless Telegraphy and Aeroplanes

THE applications of wireless telegraphy are now so widespread that much progress has been made in directions which, in the ordinary way, receive but little public recognition. One of these applications is in telegraphing from aeroplanes and airships. The advantage of being able to communicate with land or other stations was well exemplified in the case of the Wellman flight, and the gain to a military aeroplane scout in being able to send messages to his army is obvious. With the aeroplane the weight of the apparatus is important. A long aerial wire, though a necessity where distances of any length have to be covered, is almost out of the question. Many experiments have been conducted with long aerial wires trailing behind an aeroplane, and distances of a few miles have been covered by that means. In a recent issue of *The Marconigraph* reference was made to experiments carried out with Mr. McCurdy's aeroplane in the United States, and in that case only one long wire was employed, the steel wires of the machine itself being used as a counter-capacity. The idea of employing the network of wires on the aeroplane is, however, impracticable, as they become "alive," and might give serious shocks to the pilot or passenger. Two long wires appear to be the simplest solution of the problem, but trailing wires present dangers in so many ways to a machine travelling at a high speed through the air that pilots might rarely consent to their use.

Mr. Robert Loraine (the Actor-Aviator), who carried out some Wireless Experiments on an Aeroplane in conjunction with Mr. Thorne Baker.

The Early Work.

In a lecture before the Royal Institution, Mr. T. Thorne Baker passed in review some of the work already accomplished in the application of wireless telegraphy to aerial navigation and referred to some satisfactory results obtained by Mr. Farman by using two trailing aerials, each consisting of rather thin wire about one hundred metres in length. Those experiments were carried out some time after Mr. Baker had adapted a similar arrangement to a Bristol biplane in this country. In the latter case no loose wires were used, and thus he had been limited to the amount of aerial that could be attached to the machine itself—about 50 ft. Instead, however, of using balanced aerials, he coupled them to each end of an inductance coil, and increased their effective length to the greatest extent possible without sacrificing efficiency. In the latest form of the apparatus he was using a 6-in. induction coil with a $\frac{5}{8}$-in. spark gap, fixed at a considerable distance from the apparatus, so as to be away from the petrol tank. Two light brass rods extended from the coil well into the space between the two main planes of the machine, and to one side of the tank, and two $\frac{3}{8}$-in. brass rods sliding over these and $\frac{5}{8}$-in. apart formed the spark gap terminals. Shunted across the spark gap was a condenser of the Leyden jar type, and an inductance coil consisting of seven turns of No. 14 copper wire wound on a light ebonite drum. This in-

ductance had sliding contacts so that the number of turns used could be varied in the usual manner, in order to tune the two circuits. The two aerial wires were connected to the two ends of the inductance in use, and the aerial circuit was brought into tune with the shunt circuit. A secondary battery of eight or ten volts supplied the primary energy, about 50 or 60 watts being required.

Two new arrangements have since been adopted, which should greatly enhance the efficiency of the plant. The chief of these is a long light brass tube attached to, but insulated from, one side of the tail of the aeroplane. This acts as a counter capacity, or "earth," to a long aerial wire on the other side. This aerial starts from the nose of the machine, is carried thence to the extreme outer edge of the main plane, thence back to the tail, and thence to a loose extension, a length of 60 ft. of copper wire trailing behind.

Aeroplane Scouts.

Much attention has been given to the problem of receiving wireless messages on aeroplanes. For an aeroplane scout to be able to communicate with his commanding officer is, of course, of primary importance, but it would be of immense advantage if he could exchange messages or receive commands. The chief difficulty is that of noise. A visible method of receiving must perforce be selected. Mr. Baker suggests an arrangement in which a coherer is fitted up to the aerials, with a tuning condenser shunted across it, and every two seconds the coherer is automatically decohered by a striker actuated by a magnet excited by a clockwork contact maker. A relay and battery are connected in series with the coherer, and the local circuit of the relay is connected with another battery and electric lamp. Each time a signal is received the lamp lighted up—for one second in the case of a dot and for two seconds in that of a dash. These long signals are obviously necessary, but in spite of that a message can be sent with reasonable rapidity.

An alternative means of receiving on an aeroplane is to use an inker, and this method again requires the employment of the coherer. The inking apparatus is heavy, however, and requires fairly careful adjustment, so that it is rather unsuitable for use where there is much vibration. The question of vibration is a serious one with the ordinary coherer, for if mechanical decohesion is very rapid, it might be impossible to make the coherer work long enough to get the local side of the relay to work effectively. The actual number of impulses per second in an aeroplane travelling 30 miles per hour, with a Gnome 7-cylinder engine, is on the average too great for the coherer to act. In that case it becomes necessary to employ an anti-vibration holder to take off the abruptness of the shock, or a coherer which is insensitive to the abruptness of the shock.

Telegraphing from Balloons.

Wireless telegraphy from balloons and airships has reached a more satisfactory stage. Of first importance is the ability to suspend a long wire from the balloon, and next the weight-carrying capacity of the balloon itself. The apparatus used in the Beta military airship weighed roughly 100 lbs. and signals had been transmitted, under favourable conditions, a distance of about 50 miles, so that the ratio of weight to distance of transmission was roughly 2 lbs. to the mile. An ordinary induction coil and accumulator had so far been used in the experiments and one trailing aerial wire and a counter-capacity. In the counter-capacity what was required was superficial area to take the electrical charge, and hence as light a substance as possible might be chosen.

The form of the future wireless outfit for airships would, Mr. Baker suggested, consist of a two-cylinder petrol engine coupled directly to an alternating current generator, the output of the latter being about 2 k.w., an aerial wire about 350 ft. in length, and a counter-capacity in the form of very thin metallic sheeting suitably disposed. Either a transformer for producing the high tension current and a zinc spark-gap or an arc transmitter would be employed.

Attention has been directed during the last few months to the production of portable apparatus. The chief limiting factor in small receivers is in connection with the detector. The vacuum valve detector of Professor J. A. Fleming will probably be the most suitable in many respects, and next to that an electrolytic detector.

A pathetic example of a new development in the use of wireless telegraphy as a consoler and helper is telegraphed from New York. It is stated that a well-known millionaire, who was travelling under an assumed name, attempted to commit suicide on board the French Transatlantic liner "La Lorraine." Ill-health is given as the reason for the attempt. His son, who was on board the "Kaiserin Auguste Victoria," communicated with his father by wireless telegraphy in affectionate messages, pleading with him and consoling him in his depression. The report does not state whether the plea was successful, but while hoping that the curative effects of wireless will not be neglected by persons suffering from depression, we cannot recommend suicide or attempted suicide as a means of giving prominence to this new phase of wireless.

Freak Communications

The Scottish National bard who assured us, with that unerring accuracy which is sometimes the unconscious product of the poetic instinct, that

"The best laid schemes o' mice and men
Gang aft a-gley,"

uttered a sentiment which all who are engaged in scientific investigation or in the application of scientific principles will endorse with fervent sadness. Who has not read in one of Mr. H. G. Wells's scientific romances of the absent-minded inventor who, desirous of exploring the lunar regions, set to work upon the production of a substance that would gravitate towards the moon? The premature birth of this substance, however, had effects which were entirely unforeseen and which just escaped depopulating the terrestrial globe and causing other grave inconveniences. To cite examples of "freak" occurrences that are experienced in every-day life would require more space than is available for a single article.

Wireless "freak" communications are wrapped up in the phenomenon of variations in the transmitting efficiency of the atmosphere. Perturbances in this respect exhibit almost the same characteristics of irregularity as atmospheric impulses. Freak ranges of communication or variations in range of communication occasionally occur by day, but are not (in the case of comparatively short-range coast stations) then of a pronounced character. The variations noticed during the night hours are more pronounced. The sudden veiling or obscuring of distant signals, together with the equally sudden "opening out" of signals observed whilst listening on the receiver at a wireless station during the prevalence of this phenomenon, is very impressive. These variations of range are not found to synchronise definitely with the periods of atmospheric disturbances, though it may well be that more disturbances are observed when the range extends. Communications taking place at ranges of less than 100 or 200 miles appear to be rarely, if ever, influenced by this phenomenon in these latitudes.

It appears probable that the phenomenon is closely connected with changes of an electrical nature occurring in the upper regions of the atmosphere, and as a possible though speculative clue, it may be suggested that the effective receiving range of a station is determined not so much by the height of its aerial system as by the height from which it will experience inductive influence, or in other words, the height to which the lines of electric strain emanating from the aerial under the influence of the atmospheric potential gradient will persist.

Diary of Events.

[Under this heading we give a monthly record of the progress of Marconi wireless telegraphy. Apart from the general and historical interest which attaches to such a compilation, we have reason to believe, from the number of inquiries that constantly reach us, that it will be of much service to lecturers, tutors and others who may be professionally interested in the subject. Appended are some notable events that have occurred in August of preceding years.]

1899.

August 27th.—Communications passed, by means of Marconi apparatus installed at the Dover Town Hall and at Wimereux in France, between the meetings of the British Association at Dover and the Association française pour l'Avancement de Science at Boulogne.

1901.

August 8th.—Agreement signed for reporting of international yacht races in the next two months between the "Columbia" and "Shamrock II."

August 16th.—Nantucket Wireless Station commenced working commercially.

1902.

August 30th.—Messages from Poldhu received on the Italian battleship "Carlo Alberto" at Ferrol.

1903.

August 22nd.—Mr. Marconi left Liverpool on SS. "Lucania" and conducted experiments in long-distance telegraphy throughout the voyage. News messages received and published on board the "Lucania" from Cape Breton Station shortly after leaving the British coast.

1904.

August 4th.—Public wireless service between Bari and Antivari inaugurated.

August 11th.—British postal authorities undertook to grant to Marconi's Wireless Telegraph Co., for a period of fifteen years, facilities for handling long-distance messages, and for eight years to grant to the Company licences for ship and shore communication, and further to grant to the Company the right to charge an additional rate not exceeding the rate allocated to shore stations for every message interchanged with systems other than the Marconi.

1906.

August 4th.—La Compañia de Telegrafia Sin Hilos del Rio de la Plata formed to acquire and work the Marconi patents and rights in Argentina and Uruguay.

1907.

August 17th.—Agreement made with the Lloyd Italiano for the equipment of its vessels.

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The Editor will be pleased to receive contributions; and Illustrated Articles will be particularly welcomed. All such as are accepted will be paid for.

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Morocco Bound.

Recent events in Morocco have attracted world-wide attention. With the political aspect of the situation this journal has no concern, and in the ordinary way the arrival of the German gunboat “Panther” at Agadir and its subsequent replacement by a German cruiser would have passed unnoticed. Whatever differences of opinion there may exist concerning the action of the German Government in substituting a cruiser for a gunboat, there is surely no one who will deny that, from the German point of view, there was much wisdom, if not ingenuity, in the explanation given in some of the newspapers of the Fatherland, that the change was brought about by the desire of the Government to have a vessel in the Moroccan waters fitted with an equipment for wireless telegraphy. This incident brings home most forcibly the remarkable importance of wireless telegraphy in naval affairs. That the question has long since passed the stage when any doubt can exist as to the utility of wireless it is only necessary to refer to the activity of the British naval authorities in the matter, and, judging from the amount of public interest therein, it requires no great prophetic vision to predict that in future the question of wireless will loom more largely in the parliamentary discussions on the Naval Estimates than it has done in the past.

The Conquest of the Air.

The article which appears on page 13 of this issue, and in which developments in the application of radio-telegraphy to aeronautics are described, deserves more than passing attention. It shows with unmistakable clearness how easily the progress in wireless adapts itself to advances made in the realms of science, engineering and practical everyday affairs. No less significant and important are the services which wireless is able to render to meteorology. Areas which formerly were beyond reach have now been brought within easy reach of London, thus furnishing the meteorological department of Great Britain with accurate information upon which to base the weather reports, instead of the empirical data that the department had at one time to rely upon. Radio-telegraphy is an art as well as a science, and both are progressing. The splendid services already rendered by the Marconi system to aviation and to meteorology are at once a proof of present perfection and an evidence that the arduous labours of its inventor have borne fruit in yet larger power than was dreamt of to command the forces of Nature for the use and benefit of mankind.

The Factor of Safety.

The German Government have under consideration the question how far the compulsory introduction of wireless telegraph installations is desirable in the interest of the navigation of merchant vessels, and especially for the safety of the passengers and crews. A conference on the subject took place recently in Berlin in the presence of representatives of the Government and of the shipping interests, the idea in the first place being an amplification of the regulations for the prevention of accidents to the seafaring profession.

Company News

Marconi's Wireless Telegraph Co., Ltd.

An event of the past month has been the fourteenth annual meeting of Marconi's Wireless Telegraph Co., Ltd., which was held in London on July 20th. The report and balance-sheet for the year ended December 31st, 1910, showed that during the period under review the business of the Company has made considerable extension, the gross trading profit for the year having amounted to £127,452 13s. 1d. and the net profit carried to balance-sheet £60,513 0s. 3d.

In the early part of the year the directors resolved that it was time there should be an end to the infringements of the Company's patents. An action was accordingly commenced against one of the infringing companies, resulting in a declaration of the validity of the Company's Patent No. 7,777. This patent is of paramount importance, embracing syntonisation, and with it dated the real practical commercial utility of wireless telegraphy. The directors are advised and believe that no wireless station of any practical utility can be erected without infringing this patent. It will be the policy of the directors to maintain the shareholders' rights both at home and abroad. As a result of this action substantial benefit accrues to the Company in the form of compensation and in other ways. Reference was made in the report to the large sums of money which in the past have been expended by the Company in experimenting and developing long-distance wireless telegraphy, and the hope expressed that these will be well rewarded. The Company alone have succeeded in erecting long-distance stations able to conduct day and night commercial wireless telegraph service. The future policy of the Company lies mainly in this direction, and negotiations of an important nature are pending to erect and work, or be interested in the working, of a chain of wireless telegraph stations around the world.

The Belgian Co. have declared and paid dividends for the year ending December, 1910, amounting to 50 francs per Capital Share (10 per cent.) and 24 francs per Founder Share. The French Co. have declared and paid a dividend for the past year at the rate of 5 per cent. per annum. The Marconi International Marine Communication Co., Ltd., whose business also is growing extensively, have declared for the year ending December 31st, 1910, a first dividend at the rate of 5 per cent. The balance-sheet shows that this Company owns 200,182 fully-paid shares in that Company of a total capital issued of 204,056 shares.

Owing to the strenuous competition and other circumstances which obtained in Germany, an agreement has been entered into by the Belgian Co., with this Company's consent and approval, under which all the mercantile vessels in Germany flying the German flag, fitted with either the Telefunken or Marconi system, were transferred to a new company entitled the Deutsche Betriebsgesellschaft für Drahtlose Telegraphie m.b.H. Neither this Company nor the Telefunken Co. will in future fit any mercantile vessels flying the German flag; this business will be carried on exclusively by the new company, who now hold the licences from both the Telefunken and Marconi Companies for this purpose; the system installed will be known as the "Debeg." The arrangement embraces the German mercantile marine only. The Belgian and the Telefunken Companies hold the shares of the "Debeg" Company, and the Board is composed of members of those two companies, and include Commendatore Guglielmo Marconi and Mr. Godfrey C. Isaacs. The Company's business generally continues to show substantial increase, and the directors recommended the payment of the cumulative 7 per cent. dividend upon the Preference Shares to the end of December, 1910, which will absorb the sum of £16,599 13s. 2d. There will thus remain to the credit of profit and loss account the sum of £49,119 4s. 8d., which will allow of, and the directors will recommend, the declaration of a dividend upon the Ordinary Shares. Subject to the approval by the general meeting of the payment of dividend upon the Preference Shares above recommended, it is the intention of the directors to immediately declare an interim dividend upon the Preference Shares for the half-year ending June 30th last at the rate of 7 per cent. per annum.

Since the last general meeting, Commendatore Guglielmo Marconi has resigned his position as Joint Managing Director of the Company, and Mr. Godfrey C. Isaacs was appointed sole Managing Director. The death of Sir Charles Euan Smith left a vacancy on the Board. Mr. Hammersley Heenan retires by rotation, but his business occupations at a distance from London do not allow of his devoting such time to the Company's business as he would desire; he therefore does not offer himself for re-election. Colonel Albert Thys and M. Maurice Travailleur, for years intimately associated with the Company's business, have been elected members of the Board.

In moving the adoption of the above report, Commendatore G. Marconi, who presided, said that the transatlantic service, which was opened in April last year, continued to work very satisfactorily, particularly in so far as the wireless operation of the service was concerned. They had, and continued to have, some trouble owing to the mutilation of code words by the land lines, which applied more to this country than to the

other side. They had arrangements in view which should eliminate this trouble; their programme, however, must be subject to circumstances. A satisfactory solution would be the continuance of their wireless service in London, provided the necessary licence could be obtained from the Post Office. In view, however, of the Government programme in connection with wireless telegraphy, this question must stand in abeyance for the present. The difficulty to which they had referred did not arise with plain English messages; these the Post Office operators seemed able to handle very efficiently.

Probable Reduction in Rates.

It was therefore probable, subject to negotiations pending, that at an early date they would carry into effect their intention of accepting plain English messages at the rate of 4d. per word. By adopting this course a great many messages now sent by code at the higher rate would be sent in plain English, and they would be at 4d. per word just as profitable, and certainly more satisfactorily handled than code at 7½d. He was engaged in making the necessary arrangements at the Clifden station for the introduction of their new duplex system, and so soon as these arrangements may be completed, and in the very early future, he was proposing to proceed to Canada similarly to instal their Glace Bay station. When this was done their service would be materially improved, and its capacity at least doubled with a very small increase in running expenses. Amongst the large amount of work completed during the past year was the construction of two stations in Brazil for the Madeira Memore Railway Company, thus putting Porto Velho into radio-telegraphic communication with Manaos. Notwithstanding the tropical climate, these stations, 600 miles apart, were giving every satisfaction, and a daily newspaper was published in Porto Velho entirely dependent for its news upon the wireless telegraph service. He made particular mention of these stations as an indication of the probable adoption of wireless telegraphy in undeveloped countries for the commercial telegraph service of the future, in place of land lines.

Military Apparatus.

They had designed several types of portable apparatus for military purposes, and business of a substantial nature was resulting therefrom. During the early part of the year they submitted to His Majesty's Government a scheme to put all the British possessions into wireless communication with each other, and applied for a concession for the erection and working of the necessary stations. From this would appear to have developed the imperial wireless scheme introduced by Sir Joseph Ward at the recent Imperial Conference. They would have preferred to have carried out the scheme as they had themselves proposed. There were, however, reasons which they were quite able to appreciate why the Government should prefer to take this scheme in hand themselves under a working arrangement with that company. They would, however, be equally satisfied if their negotiations eventually resulted in their erecting the stations on behalf of the Government upon terms which would compensate the Company for the large sums of money and the immense amount of work which it had devoted to the development of long distance commercial wireless telegraphy. They were satisfied that the Government recognised it was solely due to that Company's patents and to the experience and knowledge which it had obtained through its work in connection with its commercial operation of the transatlantic service that the imperial scheme had come within practical politics. They were engaged in active negotiations with foreign Governments for the erection of other long distance wireless telegraph stations in countries outside the British Empire, which stations would either be worked by them or they would remain interested in the working of them. The policy of the Board was to erect long distance commercial wireless telegraph stations throughout the world and to remain interested in the working of them. The judgment obtained against the British Radio-Telegraph and Telephone Company had materially strengthened the position of their Company.

The Board had decided to declare an interim dividend upon the Ordinary Shares for the six months ending June 30th, 1911, at the rate of 10 per cent. per annum.

Mr. Godfrey C. Isaacs, who seconded the adoption of the report, said there was big work yet to be done, and the Company intended to do that work. The Canadian Company were making excellent progress, and the atmosphere being now clear, it was more than probable that when the next meeting was held they would be able to announce that the Canadian Co.'s indebtedness had been satisfied. The shares of the Company were now officially quoted on the Bourses of Rome, Genoa, and Amsterdam, and to these Paris and Brussels will probably be added very shortly.

The Share Market

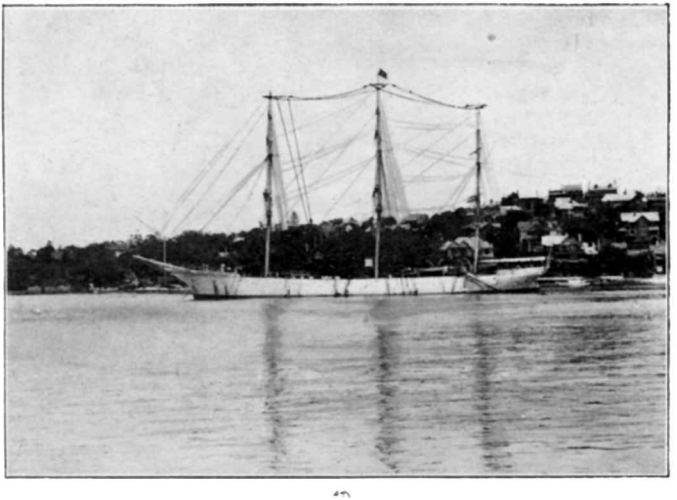
The publication of the report of Marconi's Wireless Telegraph Co., Ltd., was awaited with much eagerness, and much curiosity was displayed as to the amount of the dividend which would be declared on the Ordinary shares. The Company's shares have been very active during the past month, dealings having actually taken place at 50s. The making-up prices on July 26th were :

Ordinary	42s.
Preference	40s.

Wireless on a Sailing Vessel
The Cadet Ship "Mersey"

By Lieut. FREDERICK CROSS

THE cadet ship "Mersey," in which the White Star Line are training 60 cadets for their service, recently arrived at the London Docks on the completion of her third voyage round the world. She is under the command of Lieutenant F. W. Corner, R.N.R. The "Mersey" visited Adelaide, Melbourne, and Sydney, and returned home laden with wool, iron rails, and tallow. The homeward voyage was accomplished in 104 days. On the voyage from Melbourne to Sydney, in January last, the "Mersey" was much delayed by severe gales. She took shelter from the heavy seas among the islands of the Bass Straits, and was confined to these narrow waters for several days. About 20 of the cadets, who had previously served for two years on board the "Worcester" and the "Conway," have completed their training and will now sit for their second mate's certificate.



The Wireless Aerials on the Cadet Ship "Mersey."

The "Mersey" carried for the first time on this voyage an installation of wireless telegraphy. By its means she was able to keep in constant communication with passing vessels while sheltering in the Bass Straits. On the homeward voyage she communicated with wireless stations on the coast of Brazil and at the Azores, and for the last week she has been supplied daily with news from home. In spite of the rumours that an American schooner was fitted with "wireless," there is no denying that the "Mersey" is the first properly fitted "wireless" sailing ship, and it can claim to be the first sailing ship to report by wireless at stations like FNR and FLO, also the English coast stations.

The "Mersey" was fitted, in July, 1910, with the double coil set suitable for transmission by means of current supplied by accumulators, the receiving apparatus being the standard Marconi magnetic detector and multiple tuner. The apparatus was under the care and working of Lieutenant Frederick Cross, R.N.R., the Instructor on board. Owing to anticipated difficulties in maintaining the aerial between the mast heads of a sailing ship, it was decided to place only a small aerial about 80 ft. in height. This installation and arrangement, in the hands of an experienced operator, would have given approximately a range of 50 miles, but owing to inexperience only short distances were bridged in communication. Nevertheless, it must be considered exceedingly satisfactory, when taking into consideration the entire absence of experience with wireless on the part of person operating, that the apparatus should have worked for eleven months without a single breakdown. After being at sea for some time it was decided to fix the aerial at the mast heads, and a very great improvement resulted, communication being maintained over 185 miles and during the night hours over 300 miles.

Some of the experiences on board were rather amusing. When the vessel left Liverpool no one on board knew much about wireless telegraphy, and as day after day passed without any calls being made we became a little suspicious of the apparatus, after the fashion, I suppose, of the inexperienced workman who blames his tools for faulty work. However, the officer on deck was instructed to scan the

horizon carefully for approaching "aerials." One day there was great excitement on board when the "Amazon" was sighted. We hoisted the International Code Flag Signal, "Please stand by; wish to communicate by wireless." Doubtless this strange proceeding on our part must have surprised the officers of the "Amazon," who, however, called us up and exchanged communications with us. Flushed by our initial success we continued on our sail, but to our dismay we exchanged no further messages, and again turned suspiciously to our apparatus. Upon our arrival in the port of Adelaide we anchored half-a-mile from the "Suevic," from whom we learned that our communications were too faint to be understood. That determined us to fix the aerial at the mast heads, as mentioned above, and by the time we reached Melbourne everything was working splendidly. Whilst at Melbourne we forwarded a telegram for the "Runic," lying off the Straits, and whilst waiting at Queenscliffe for a fair wind forwarded to the "Mantua" a communication from her agents.

Our experience with the Marconi equipment was most satisfactory, and should go far to encourage owners of sailing vessels to furnish their boats with similar equipments.

Progress at Land Stations

A CORRESPONDENT at Las Palmas sends us two photographs of the Melenara Station, which is now being erected by La Compania Nacional de Telegrafia sin Holos. We hope to give a full description of this interesting station in a future issue, but in the meantime the accompanying illustrations will serve to indicate the general lay-out of the buildings. Fig. 1 shows a front view of the Melenara Station, which comprises (reading from left to right) an engine-room, an accumulator room, a land-line office, an operating room and house. Fig. 2 shows the long and short aerials leading into the station.

Fig. 1. The Melenara Station at Las Palmas.

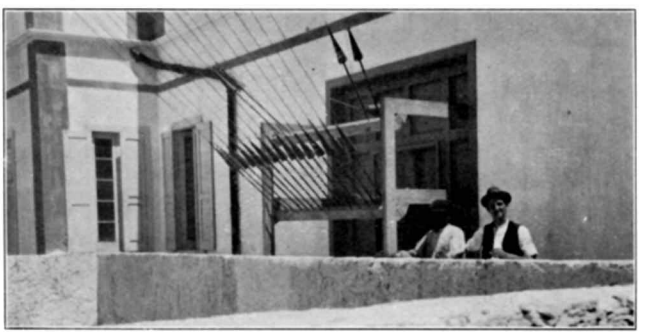


Fig. 2. Aerials in Melenara Station.

The Italian Government wireless station at Becco di Vela has been closed, and a new station at Taranto, with a range of 500 kilometres, was opened to public service on May 15th. The Government wireless stations at Capo Mele and Capo Sperone are now opened day and night for public service.

✦

The Italian Government has established a coast station tax of 30 centimes per word on all radiotelegrams exchanged between its coast stations and ships at sea. The total wireless rate will thus be 7d. per word, and to this will be added the usual forwarding charges from the coast station to destination.

✦

A twenty-year contract has been completed between the Marconi Wireless Telegraph Company of Canada, Limited, and the Canadian Government, for the operation of the latter's coast stations in Eastern Canada, including the stations in the Gulf and River St. Lawrence.

Book Notice

"A Handbook of Wireless Telegraphy," by James Erskine-Murray, D.Sc. Third Edition, 1911. (Crosby Lockwood and Son: 10s. 6d.)

Dr. Erskine-Murray is to be congratulated upon the third edition of his book. When it is remembered that the book made its first appearance in 1907, and was thoroughly revised in 1909, it will be realised how rapidly wireless telegraphy is advancing. Dr. Erskine-Murray has no intention of allowing his book to become out of date, and the present edition reveals an unsparing revision both by the addition of new matter and the deletion of obsolete portions.

For the greater part of the book we have nothing but praise. The earlier chapters are devoted to the history of wireless telegraphy and to the development of apparatus for the generation and detection of Hertzian waves. Then follow chapters on the various "systems" of wireless telegraphy, which are particularly interesting on account of the author's wide experience and practical knowledge of most of the apparatus he describes. Next come two very interesting chapters (XVI. and XVII.), entitled "Some Points in the Theory of Jigs and Jiggers" and "On Theories of Transmission" respectively, which contain much of the author's original work, besides all the information to be obtained from other sources. Of Chapter XVIII. on Tesla's "World-Wave Telegraphy," we will only say that we do not know why it is still included in this otherwise practical book. Chapter XIX., on "Adjustments, Electrical Measurements, and Fault-testing," gives much useful information, and should prove most valuable to all who have the care of wireless apparatus.

Those who have the design and calculation of new stations to attend to will find Chapter XX. of great assistance. This chapter consists almost entirely of an admirable translation of a paper by Signor Alfredo Montel with a few remarks by the author. We wish the author had taken a little more liberty with the translation—particularly with the notation, which he has left in the Continental style. The concluding chapter gives a large number of very useful tables, curves and notes. We think, however, that in the case of a straight line law the curves might be advantageously replaced by simple formulæ. For example: "Capacity in micro-microfarads of a parallel plate condenser = area in sq. cms. of either plate divided by twelve times distance in cms. between the plates," conveys the same (and indeed much more) information than Table IV., and is quite easy to remember. An account of the International Radio-telegraphic Convention is given in an Appendix, and a useful index adds to the worth of this valuable contribution to the literature of wireless telegraphy.

Wireless as an Adjunct to a Great Stores

The Wanamaker Stations

A NOTABLE installation recently completed in the United States of America, and now working very satisfactorily, deserves recognition. There are some who have expressed doubts as to the practicability of wireless for overland communication, just as there were at one time sceptics whose ideas concerning overseas communication were, to paraphrase a well-known expression, "sicklied o'er with the pale cast of doubt." However, it soon became evident that the practical value of the principles discovered and so brilliantly applied by the genius of Mr. Marconi was dependent upon no chance conditions, but that it was determined upon sound lines. The wonderful achievements of maritime wireless telegraphy, heralded throughout all civilised countries, and made known in the distant corners of the world to which news percolate through slow and cumbersome channels, have made belief in the system well-nigh universal. But less well known, though none the less real, are the conquests made in overland communication.

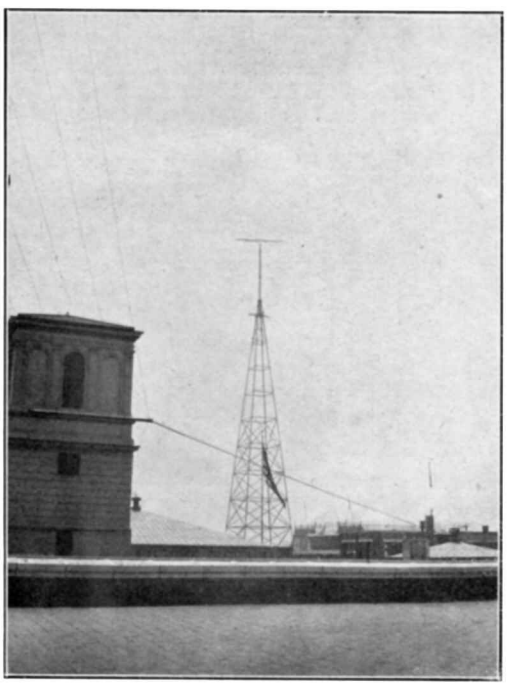


Fig. 1.—East Tower of the Wanamaker Station, Philadelphia.

In America, where postal regulations do not interfere with telegraphic communication to the extent that they do in this country, important developments have taken place, one of the most recent being the equipment of the great Wanamaker Stores in New York and Philadelphia with Marconi installations. The stores in question are of immense size and variety, and the establishment of wireless stations have not only a large advertising value, but they will result in an actual saving to the Wanamaker Stores of from eight to nine thousand dollars per annum in telephone charges. Both buildings are of modern fireproof construction, the one in Philadelphia being twelve stories high, and the New York Stores reaching the mammoth height of fifteen stories. Upon the roof of each building two steel towers have been erected with heavy topmasts, the over-all height being 120 ft. The east tower of the Philadelphia station is shown in Fig. 1. The latest American type 5-k.w. Marconi transmitting sets with disc dischargers and valve receivers are used, and the stations have been tuned to a transmitting wave length of 1,800 metres, and by this wave length communication between New York and Philadelphia, a distance of ninety miles overland, is negotiated with great ease and without any interference from the thousand and one commercial and amateur installations in the immediate vicinity of each station. Fig. 2 shows the operating room, and Fig. 3 the generating set, both of which are at Philadelphia.

The stations are also used for the transmission of messages received at the Wanamaker Stores to ships at sea, and for the large quantity of private messages between New York and Philadelphia. The service has been so satisfactory that it has been found possible to dispense with the private wire telephone service formerly serving as the means of communication between the two stores.

Both the New York and Philadelphia stations have been heard by ships as far east as Sable Island, a distance of some 800 miles, a large portion of which is overland.

It might be added that the stations are open for general public service between the hours of 8.30 a.m. and 6 p.m. on weekdays. They

are worked by operators in the employ of the Wanamaker Stores, as the American Marconi Company do not undertake inter-state business. On the day of opening the service the Mayor

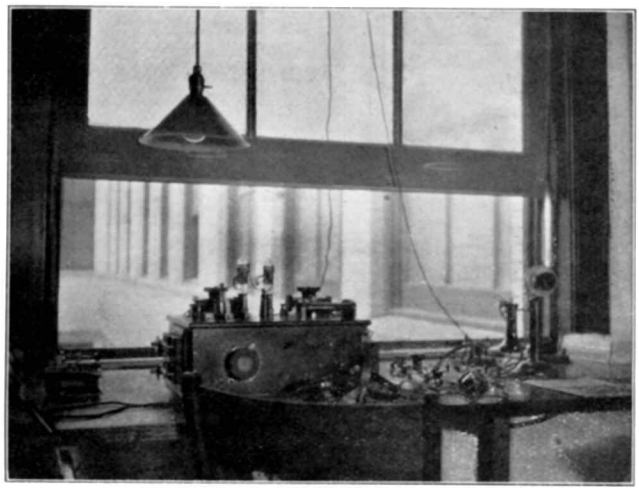


Fig. 2.—View of the Operating Room at the Wanamaker Station, Philadelphia.

of Philadelphia sent the following message to the Mayor of New York :

> Sincere greetings and congratulations on the completion of enterprise which gives Wanamaker Wireless one more tie for service and friendship to unite our cities.

Mr. George Wanamaker, ever to the fore where commercial enterprise is concerned, has realised the stimulus that wireless telegraphy can give to business, and the unqualified success of the Marconi installations on the roofs of his gigantic stores in New York and Philadephia is substantial food for reflection. The public appreciation of the advantages of these installations vies with the commercial benefit which accrues to the Wanamaker Stores, and there is reason to believe that the example will be extensively followed in those countries where the postal regulations do not prevent the use of private telegraphs.

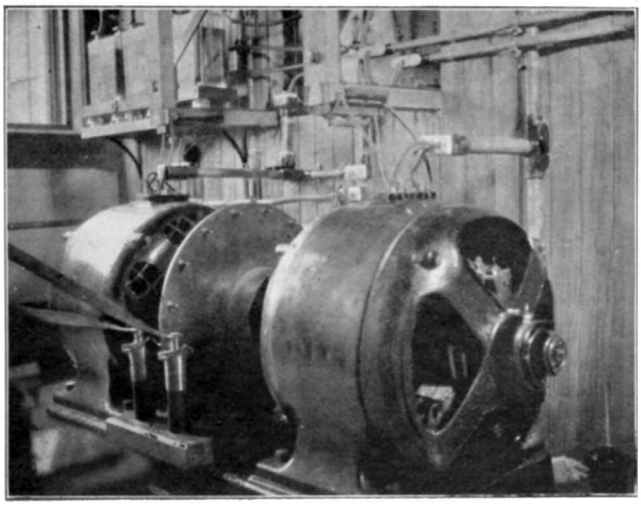


Fig. 3.—The 5-k.w. Transmitting Sets.

Australasian News

(*From a Correspondent.*)

Sydney, June 2nd.

There has apparently been some lack of enterprise in the Southern Dominion. It is some years since Capt. Walker, on behalf of Marconi's Wireless Telegraph Co., succeeded in establishing communication between King Island, Tasmania, and the mainland, but up to the early part of June no commercial stations were operating, either in Australia or New Zealand. This state of affairs will soon give way, however, to one more in harmony with the spirit of the age, for work has already commenced on the site of the proposed Government Wireless Station at Pennant Hills, near Sydney, and some of the buildings are in course of erection, but no date can be given yet for possible completion of the station. Arrangements are being made by the Commonwealth Government for the provision of temporary stations at Sydney and Melbourne.

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Until about three years ago the arrival here of a merchant ship equipped with wireless telegraphy was a thing of rare occurrence; but since the two large mail shipping companies, the P. and O. and the Orient Line, have set an example by equipping their liners with Marconi apparatus, other shipping lines engaged in the Australasian trade have been quick to follow suit. At present there are thirty passenger ships sailing between British ports and Sydney and Melbourne which are equipped with Marconi apparatus.

These vessels belong to five different lines, and represent a gross tonnage of over 306,174. In addition to these lines is the *Zealandia*, which sails between Canada (Vancouver) and Australia.

✦

The coasting ships, employed in the Australian interstate services, are among the finest coastal steamers in the world. The first of these to have Marconi apparatus installed was the SS. "Karoola," which belongs to Messrs. MacIlwraith, McEacharn Proprietary Co., Ltd., of Melbourne, and the SS. "Grantala" and the "Koombana," of the Adelaide Steamship Co., Ltd. The 1½-k.w. standard ship sets have been installed on these ships, and it is expected that others will shortly be equipped with similar sets.

Marconi operators on the ships arriving here have reported that communications have been held by them with other ships and with coast stations over distances from 800 to 2,000 miles at night. All ships report good communication with the Marconi Station at Durban.

Canadian News

Montreal, 17th July, 1911.

The Marconi Wireless Telegraph Co. of Canada, Ltd., have submitted to the Dominion Government a return showing the number of messages and the number of words handled through the Canadian stations during the year ended March 31st, 1911. The company's stations are at Halifax, Sable Island, Cape Sable, St. John, North Sydney, Pictou, Cape Bear, Cape Race, Cape Ray, Fame Point, Clarke City, Father Point, Heath Point, Belle Isle, Point Amour, Point Rich, and Harrington. The number of messages handled reached a total of 87,180, representing 960,641 words. September, 1910, holds the record as the month in which the largest number of messages were handled, viz., 10,108 messages, representing 150,897 words; next comes August, with 9,838 messages and 132,329 words.

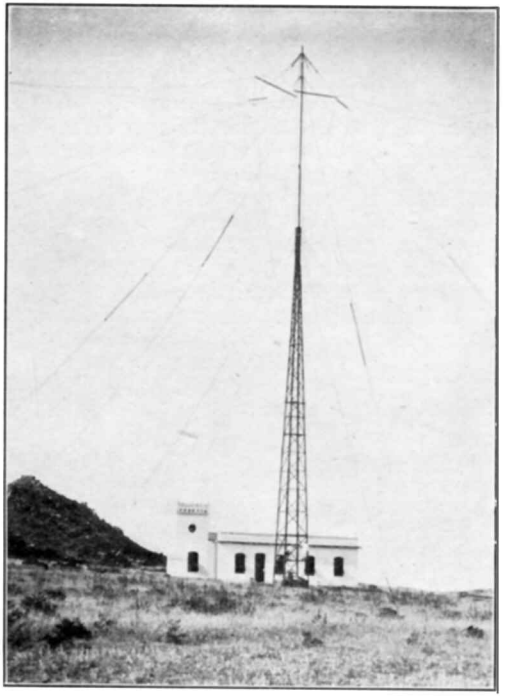
✦

In a recent issue the *Railway and Marine World* publishes the following paragraph: "In connection with recent Press reports to the effect that the Northern Navigation Co. intended to equip its vessels with wireless telegraphy apparatus this year, we are officially advised that as there are no receiving stations on the Canadian side of the lakes it would be useless to so equip the vessels at present." Mr. N. G. Neill, Industrial Commissioner, Port Arthur, Ontario, has written to the Canadian Co. with reference to the above as follows:

"A wireless telegraph station was erected at Port Arthur in the fall of 1910, and established communication with the other stations on Lake Superior—namely, at Isle Royal, Grand Marias, Duluth and Calumet. It was very shortly after the station was in operation that the advantages of the wireless telegraph were demonstrated. The steamer 'Dunelm' of the Inland Lines went ashore on Isle Royal, and although she was not equipped with the apparatus, a freighter which had the wireless telegraph apparatus strung between her masts was within sight of her distress rockets and immediately flashed the distress signals to the wireless station at Port Arthur. The powerful tug 'James Whalen' was immediately sent to her assistance. The advantages of this invention were further shown when the wrecking outfit was working alongside of the 'Dunelm.' By constant exchange of messages being kept up between the wreck and Port Arthur, the boats were warned of approaching storms and enabled to seek shelter in the neighbouring bays during operations. The hazardous work of towing the wreck to the dry docks at Port Arthur was shortly afterwards undertaken."

Stations Round the Italian Coast

Ten years ago a number of small wireless stations were erected round the coast of Italy. At that time wireless telegraphy was in its practical and commercial infancy; the genius of Mr. Marconi was incessantly occupied in the development of his wonderful ideas, and the world had not yet awakened to the immense potentialities which his investigations possessed. But these stations helped to show what the Marconi system was then capable of doing. The cycle of time has wrought many changes, notable among which is the inability of the present Italian stations to cope with the traffic which it is now called upon to handle. These stations, twelve in number, were of an



The Aerials at Castiadas

average of 2 k.w. each, and they have carried out a considerable amount of work with exceedingly good results. Some of the stations are only open for business during the day, others by appointment, and one or two are limited to ship requirements. In the course of time, however, those stations will be superseded by much larger ones, a commencement in this process of evolution having already set in. In addition to the large station at Rome, particulars of which are given on page 1 of this issue, orders have already been received for three new 15-k.w. stations, one each at Venice, Taranto, and Spezia. Others are in contemplation. One station has recently been erected at Castiadas, near Cagliari, Sardinia, and we are able to show two interesting photographs thereof.

Instrument Room—Operator Receiving a Message.

One of these photographs shows the aerials which have been specially insulated to ensure a good earth. One cannot help but notice the daintiness which the designer has been able to introduce into the mast, which from the purely artistic point of view is an improvement upon the plain construction of masts generally.

In the other photograph an operator is shown in the act of receiving a message.

The Castiadas station has been erected by the Marconi Company for the Italian Ministry of Posts and Telegraphs, but will be operated by a staff provided by the Italian Ministry of Marine. The station will shortly be opened for public service, and has been specially designed for communications with the Naples and Palermo stations. It will also communicate with sea-going vessels equipped with Marconi apparatus.

Maritime Wireless Telegraphy

AS the date of publication of *The Marconigraph* has been altered so that, commencing with the present number, the journal will appear at an earlier date than formerly, it was necessary to close these pages for press before the end of July. In consequence of this we are able to print this month less than three weeks' record of the orders received for the equipment of ships, which accounts for the somewhat smaller list. Up to July 21st the following vessels were fitted by the Marconi International Marine Communication Co., Ltd., with 1½-k.w. and emergency apparatus, the names of the companies being given in parentheses: SS. "Tarquah" (Elder Dempster), SS. "Tainui" (Shaw, Savill and Albion Co.), CS. "Sherard Osborn" (Eastern Telegraph Co.), SS. "Drumcraig" (Chadwick and Sons), SS. "Gloucester Castle" (Union Castle Line), SS. "Ruapehu" (New Zealand Shipping Co.), SS. "Asian" and SS. "Antillian" (Leyland Line), SS. "Christopher" (Booth Line), SS. "Ben-My-Chree" and SS. "Viking" (The Isle of Man Steam Packet Co.).

In addition to the afore-named, the following vessels are now being equipped with Marconi apparatus: The SS. "Pancras" and the SS. "Antony" for the Booth Line, and the SS. "Herefordshire" for the Bibby Line.

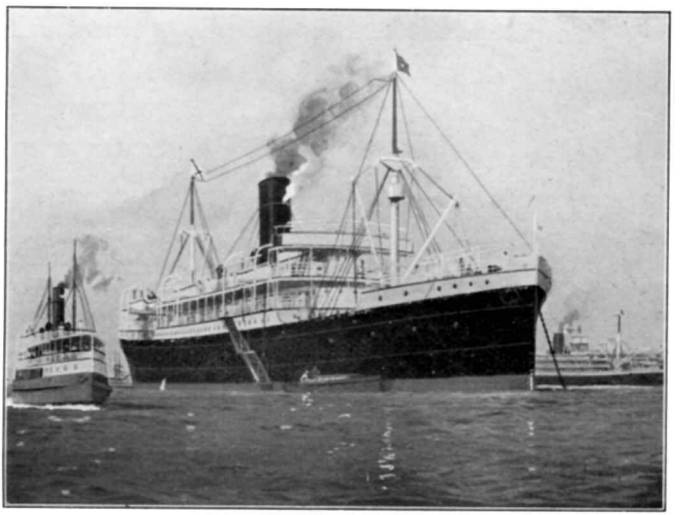
The Marconi International Marine Communication Co., Ltd., have also concluded an agreement with the Trinidad Shipping and Trading Co. for the equipment of their three steamers, the "Grenada," "Maracas" and "Pegu" (subsequently to be renamed "Mayaro"). These installations will comprise standard sets.

Of Messrs. Elder Dempsters Company's express boats, running between Liverpool and West Africa, the SS. "Karina" is the latest to be fitted with the Marconi Company's standard plant. This vessel is the second of the African service to be fitted with wireless apparatus, but it is the intention of the owners to have all their express steamers on this route similarly equipped.

The SS. "Pachitea," belonging to Compania Peruana de Vapores y Dique del Callao, trading on the west coast of South America, has also been fitted.

An agreement has been made between the French Government and the Marconi Companies, whereby the restrictions hitherto imposed on French vessels fitted with the Marconi apparatus against communicating on the high seas with ships fitted with other systems of wireless telegraphy has been removed. The removal of these restrictions also applies to certain stations along the French coasts, and in future communication by wireless will be allowed without restriction between all vessels carrying wireless installations.

The Italian Agency of the Marconi Company have made arrangements for the publishing of a "wireless" newspaper on board one of the Lloyd Italiano's steamers.



The SS. "Christopher" of the Booth Line

New Wireless Rate for Ship Business

It is announced that important reductions in the charges in the radio-telegraphic service have been made by the Dominion Government of Canada and have now come into force.

A ten-word message may now be sent for 50 cents, whereas the old rate was $1.20.

The new rate only applies to ship business, such as vessels communicating with their owners on land.

This reduction will undoubtedly draw a great business to the Dominion Government stations on the coast.

Movements of Telegraphists

Mr. A. B. Bower has been transferred from the "China" to "Persia," both belonging to the P. and O.

Mr. J. R. T. Williams, formerly second operator on "Romanic," has been transferred to the "Batavier V." (Batavier Line).

Mr. A. J. Matt Lysse, late of the "Batavier," has been appointed for duty at the Cadiz Station.

Mr. H. E. Penrose has been transferred from the P. and O. vessel "Mantua" to the "Osterley," belonging to the Orient Line.

Mr. H. W. Leach, late of the "Minnehaha," has returned to Clifden, where he formerly spent two years.

Mr. P. Partington has gone from the "Clearense" (Booth Line) to the "Minnehaha" (Atlantic Transport Line).

Mr. W. Crabb, late of the "Andorinha" (Yeoward Bros.), has been transferred to the "Manda" (Aberdeen Direct Line).

Mr. T. Muschamp, late second operator on the "Lusitania," is now on the New Zealand SS. Co.'s "Knapehu."

Mr. N. B. W. Wheeler, late of the "Ortego" (Pacific Steam Navigation Co.), has been transferred to the "Themistocles," of the Aberdeen White Star Line.

Mr. D. Sutherland, late of the "Caledonia," Anchor Line, transferred to the new Union Castle boat, "Gloucester Castle."

Mr. E. W. Hynes, who on February 24th was unable to sail on the SS. "Saturnia" owing to illness, is now recovered and is on the Anchor liner, "Caledonia."

Mr. J. Calwell has been appointed to take charge of the equipment of the P. and O. "Mantua."

Mr. H. Rowlands, of Liverpool, has taken charge of the installation on the "Montfort," owned by the Canadian Pacific Railway.

Mr. A. T. Thompson, who was appointed to the "Drumcraig," was taken ill two days before that vessel was due to leave Cardiff. Mr. J. Brennan, of the Liverpool depôt, has replaced him.

Mr. H. Roffey has gone from the Liverpool depôt to the Allan liner "Pretorian."

Mr. J. G. Phillips is now on the "Buchaneer," and Mr. S. W. Spicer has taken his place on the "Saxon."

Mr. G. A. Manson, late of the "Saxon," and Mr. T. Stubbs, late of the "Albania," have been appointed to the Las Palmas Station.

Mr. E. G. Rice, late of the "Minnewaska," has been appointed to the White Star liner "Majestic."

Mr. T. J. Barron has been appointed to the Cadiz Station.

Movements of Engineers

Mr. E. J. Watts, who returned from Sofia in June, proceeded to Cape Colony on a special mission on July 15th.

Mr. N. C. Rackstraw duly reported on his return from Cocos and Singapore, and is at present on leave, having suffered from slight malaria.

Mr. S. F. Kos sailed for Borneo on the SS. "Vondel," joining the ship in Genoa on July 20th. The illustration shows Mr. Kos tuning up on the SS. "Balmoral Castle," which was one of the first of the Union Castle liners to be fitted with wireless.

Mr. S. L. Dashwood and Mr. H. McCullough sailed for India about the end of July for the purpose of assisting in the completion of the wireless telegraph stations now being erected for the Indian Government. Mr. S. R. Groser is due to leave for India a fortnight later.

Mr. C. James, on completion of the installation on the Turkish cruiser "Hamadieh," now at Southampton, will sail with that ship.

Mr. H. Caswall left on Saturday, July 22nd, for Constantinople to install the wireless telegraph plant at the station being erected there by Marconi's Wireless Telegraph Co. for the Turkish Government. The masts and buildings in connection with that station are now completed.

Scholastic Note

The following entered as learners at the Liverpool School of Wireless Telegraphy during July: Messrs. A. D. Giles, H. N. Gibson, C. M. Allnutt, C. Searl, R. A. C. Lee, S. A. Leith, B. A. Gillett, W. C. Carr and D. Robertson.

Travelling Inspectors

The Marconi International Marine Communication Co., Ltd., announce that they have appointed thirteen travelling inspectors, whose duties are: (a) To take charge of installations on ships; (b) to observe the working of ship and shore stations and, whenever necessary, to report to head office instances of inattention or bad working; (c) to visit the company's ship stations in foreign ports, inspect installations, verify maintenance certificates, and render to operators any assistance that may be required; (d) to install apparatus on ships when required.

Each inspector will have a letter or card of identification, which he will present, in order that the operator in charge of a station may give the necessary facilities for inspecting and overhauling the apparatus. Below is a list of those who have been appointed to the positions, together with a brief record of their career in the service of the company:—

W. DAVIES.—Joined Company June, 1902, and at the time of receiving his present appointment was in charge of the installation on the R.M.S. "Mauretania." He has served on various ships, and worked in Russia, Amsterdam, and other places.

J. R. STAPLETON.—First became associated with the Company in September, 1903. Previously he was in charge of installations on the R.M.S.S. "Oceanic," the "Briton," the S.Y. "Lysistrata," and other ships.

H. J. TATTERSALL.—Joined the Company January, 1904. Previously in charge of installations on R.M.S.S. "Baltic," "Aragon," "Columbia," and other ships. He was also in a sealing schooner, and at Malin Head shore station.

A. J. IRVINE.—Joined the Company January, 1904. Previously in charge of the installations on the R.M.S.S. "Umbria," "Caronia," "Orsova," and "Suevic." He was also at Clifden transatlantic station.

W. I. MCGHEE.—Joined the Company March, 1904. Previously in charge of installations on the R.M.S.S. "Carmania," "Virginian," and other ships.

J. R. ROBINSON.—Has been with the Company since August, 1904, before which he was in charge of installations on the R.M.S.S. "Adriatic," "Celtic," "Malwa," "Empress of Ireland," and other ships.

H. F. WHITE.—Also joined in August, 1904. Previously he was in charge of installations on the R.M.S.S. "Avon," "Majestic," and other ships.

W. PLATT.—Another who joined the Company in August, 1904. Was at different times in charge of installations on the R.M.S.S. "Baltic," "Carmania," "Laurentic," and at Clifden transatlantic station.

J. R. BINNS.—Became a member of the staff in April, 1905. He has been in charge of installations on the R.M.S.S. "Caronia," "Grosser Kurfurst," "Adriatic," and other ships.

S. SMITH.—Before joining the Company in August, 1905, he was in charge of installations on the R.M.S.S. "Asturias," "Carmania," and several other ships.

E. J. MOORE.—Joined the Company in January, 1907. Previously he was in charge of installations on the R.M.S.S. "Adriatic," "Araguaya," "Leicestershire," and other ships.

A. F. GOODLIFFE.—Joined the Company in February, 1908. Previously he was in charge of installations on the R.M.S.S. "Minnehaha," "Montezuma," "Mantua," and several other ships.

G. W. BALFOUR.—Joined the Company in September, 1908, after serving on the R.M.S.S. "Baltic," "Virginia," and other ships.

Appeal to the Benevolent

We should like to remind our readers of two funds which have been opened, one for the benefit of Mrs. W. J. Croxon and the other for Mrs. McIntyre. Both of these ladies had the misfortune to lose their husbands, who were in the service of the Company, and it is the outcome of a desire on the part of the colleagues of the deceased that funds have been opened to make provision for the widows and families. Since the announcement was made in the June issue of the death of Mr. McIntyre, the sum of £5 16s. has been collected from operators reporting at the London office, whilst Miss E. M. Wythes, of Birmingham, has kindly invited Mrs. McIntyre to stay with her for three months. We are grateful to Miss Wythes for her munificent offer, and trust it will be the means of enabling us to augment the fund for Mrs. McIntyre.

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No less deserving of support is Mrs. W. J. Croxon, whose husband, as we announced last month, died as the result of an operation for cancer, leaving behind him a widow and one child. Ten shillings has been received from Mr. and Mrs. B. Pontifex, which is gratefully acknowledged. We feel sure that our appeal to the staffs of the Marconi Co.'s, and to the greater public who are interested in wireless telegraphy and who follow its progress in the pages of *The Marconigraph*, for support for Mrs. Croxon will not be in vain.

✦

Contributions for either or both of the above funds, addressed to the Editor, *The Marconigraph*, Watergate House, Adelphi, London, W.C., will be acknowledged in the journal. Below is a list of the subscribers to Mrs. McIntyre's fund:

	s.	d.
J. Lewis	5	0
J. R. Binns ...	10	0
H. W. Leach ...	2	6
J. Pringle ...	2	6
E. W. Fielding ...	2	6
T. J. Barron ...	5	0
W. C. Matthews	2	6
G. J. Wright ...	3	0
J. R. T. Williams	2	6
P. H. Johnson ...	5	0
E. N. M. Wroughton	5	0
A. F. Goodliffe ...	5	0
A. J. Reynolds ...	2	6
W. H. Haywood	5	0
W. McGhee ...	5	0
J. D. Taylor ...	2	6
J. R. Stapleton ...	5	0
Carried forward £3	10	6

	£	s.	d.
Brought ford.	3	10	6
J. H. Welply ...		2	6
J. R. Robinson ...		5	0
T. H. Stubbs ...		5	0
C. J. Hunter ...		2	6
R. B. Croft ...		2	6
F. Skeet ...		2	6
G. W. Spicer ...		2	6
A. E. Baker ..		2	6
E. J. Moore ...		5	0
H. Ward		2	6
A. C. Caldwell ...		2	6
R. J. Thompson		2	6
R. Cox		2	6
H. J. Gallagher...		2	6
L. L. Jones ...		2	6
Anonymous ...		0	6
Total ...	£5	16	0

Question and Answer

[Under this heading we shall be pleased to answer any inquiries of general interest which our readers may address to us, or to deal with practical problems concerning which additional information may be required.]

Electron.—LONG-DISTANCE TELEGRAPHY. — A discussion arose in a circle of friends interested in wireless telegraphy as to the distance that a message can now be transmitted. Can you enlighted me? *Reply.*—Commercial messages pass regularly and with complete success between Clifden (Ireland) and Glace Bay (Nova Scotia), a distance of 2,300 miles. Last year, however, Mr. Marconi was successful in receiving signals at Buenos Ayres from Clifden, a distance of more than 6,000 miles, which is the greatest distance for wireless messages known.

Personal

Lieutenant Frederick Cross, R.N.R., Instructor on board the White Star training-ship "Mersey," has obtained a certificate of proficiency in radio-telegraphy granted by the Postmaster-General. Lieutenant Cross, who is in charge of the Marconi installation fitted on board the training-ship "Mersey," is the first officer of the British mercantile marine to pass the Government examination in radio-telegraphy.

✦

Mr. Jack R. Irwin, the man who made Wellman famous, and who has been touring the Western States of America lecturing on wireless telegraphy, was recently married to Miss Helen MacPage at Portland, Ore.

✦

Chess Match by Wireless

M.P.L. rang out the call—the operator of the Marconi wireless station on the Union Castle Liner "Kinfauns Castle," always on the alert for danger signals, stood ready—but his fears were groundless. The message from the "Marathon" was in the nature of a chess challenge. A game of chess was thereupon fixed up between the passengers of these two vessels, then 200 miles apart, and after close play a very interesting match ended in a victory for the "Kinfauns Castle."

Wireless for the Farmer

The wonderful accomplishments of wireless have lately been added to by the invention of what is known as the Plant Life Energiser, by Mr. Joseph Moritz, an electrical engineer of New York City. Numerous experiments have in past years demonstrated the value of electricity in cultivation. The newest apparatus, operated by wireless, not only does what has heretofore been accomplished by the older methods but goes much further. In a series of experiments, covering the better part of three years, wireless methods have produced not only a hardier but more prolific growth. In one culture of the well-known "Hoffman Strawberries," Mr. Moritz produced by his wireless apparatus a berry which matured forty-one days earlier than ever before, and this in the same soil alongside of non-electrified berries. By a unique application of this invention it has been found that wireless will successfully stamp out the pest which has caused immense loss to the fruit growers, namely, the San Jose scale. It has likewise been found that frosts can be warded off. There is no doubt that this invention will be of inestimable value to farmers and agriculturists throughout the world. A brief description of the apparatus can be best given by describing a central sending station, with pin point receivers placed at the head and foot of each row under cultivation, the current being transmitted from receiver to receiver.

✦

It was suggested in a Parliamentary question during the past month that the G.P.O. was loaning telegraphists from the Central Telegraph Office to the Dead Letter Office. "Wireless telegraphy, no doubt," was the comment of a *Star* humorist. Perhaps the witticism will become apparent after a "surgical operation."

✦

A U.S. sailor, said to be feeling thirsty, tried to induce a San Francisco shopkeeper to sell him goods for "the men on board," intending to turn the receipts into drink. The shopkeeper becoming suspicious, communicating with the U.S. "Pennsylvania" by wireless, found his customer to be a fraud, and handed him over to the police.

✦

Sir Edward Morris, the Premier of Newfoundland, was the guest of the Liverpool Corporation prior to his departure at the beginning of last month. Sir Wilfrid Laurier had already left Liverpool by the "Empress of Britain," but the vessel was held up in the Mersey and a wireless invitation was sent to Sir Wilfrid to attend the lunch.

The Trapping of Criminals.

When, if ever, the history of crime and criminology comes to be written the chapters devoted to the age in which we are now living will stand out conspicuously for the wonderful achievements made by wireless telegraphy in the trapping of fugitives from justice. To the list of delinquents who have been brought within reach of the law by the long arm of wireless must be added yet another. The municipality of Mantua, in Italy, had been defrauded by one of its officials to the extent of 300,000 lire. Upon the defalcation being discovered, the delinquent absconded and took passage on board the "Principe Umberto" at Genoa for Buenos Aires. His whereabouts for some time remained a mystery, but the Genoa detectives were consulted just in time to enable them to have him arrested as he was leaving the Italian steamship at Buenos Aires. Wireless telegraphy played an important part in the capture, for the Uruguayan authorities were able to make inquiries on board the vessel when nearing their coast, advise Genoa of the result, and so enable the arrest to be made when the steamer reached her destination.

Excursionists' Marconigrams.

The annual summer excursion of the employees of the Sittingbourne Paper Mills took place on Saturday, July 15th, and incidentally furnished another striking example of the general value and applicability of wireless. A special train conveyed 1,100 excursionists to Dover and Folkestone, and a party crossed the Channel to Boulogne. As the boat was late in returning, there was a danger that the special train would leave Folkestone before the Channel trippers reached the shore. But a Marconigram was despatched from the steamer (which was fortunately equipped with wireless) to Folkestone, and the train was held up until the Boulogne party arrived. This is the first time in the history of these excursions that Marconigrams have been used with such conspicuous success.

In response to wireless messages sent from the steamer "Tottenham," which was wrecked on the island of Juan de Nova, near Madagascar, the officers and crew were rescued by H.M.S. "Forte," which was despatched to their aid. They were landed at Durban, and eventually arrived safely at Plymouth. The "Tottenham" had been ashore three weeks, during which several efforts had been made to refloat her, but without success.

Athletics.

The ten-miles walking race held during the month among the members of the Marconi Athletic Club of Chelmsford resulted in a victory for A. Garner, G. Dumenal and H. Corfield being respectively second and third. Owing to its failure to obtain sufficient starters, the club had to abandon the proposed entry of a cycling team at the Essex County Sports. W. W. Spalding, one of the members, however, received a medal in the high jump contest at these sports for successfully clearing over five feet.

The Marconi Athletic Club of London has not met with any pronounced success during the month in their cricket matches. Five matches have been played, all of which were lost, the club being much handicapped by several of its best members being unable from various causes to turn out.

It has been decided, says *The Western Morning News*, to shorten and simplify the syllabus of the wireless telegraphy course for signal officers as follows:—

The course will last five weeks (25 working days). During the first week instruction will be given in elementary electricity, including the following subjects:—First day, electricity, preliminary lecture; second day, dynamos and motors; third day, lighting; fourth day, searchlight, flashing lamp, etc.; fifth day, telegraphy. The remaining four weeks will be devoted to wireless telegraphy.

Marks will be awarded as follows:—Organization of wave lengths and procedure, 150; wireless telegraphy, paper, 100; wireless telegraphy, practical, 100; signals, practical, 50; total, 400. In order to pass, officers will be required to obtain 70 per cent. in the examination in organization and procedure, and also 70 per cent. of the total.

"Practical Electricity," by the late Professor W. E. Ayrton and Thomas Mather, F.R.S., M.I.E.E. (Cassell, 9s. net), is a book which is essentially a text-book and laboratory guide for a first-year student who desires to take up "Practical Electricity" as a business or profession. The book has been carried out mainly on the late Professor Ayrton's own lines, embodying his natural method of instruction as distinguished from the mode of the mere scholastic primer. Commencing with an explanation of what is meant by electric current, the book deals subsequently with magnetic fields, with various measuring and indicating instruments, and in particular with several kinds of ampere-hour meters.

NOTICE

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