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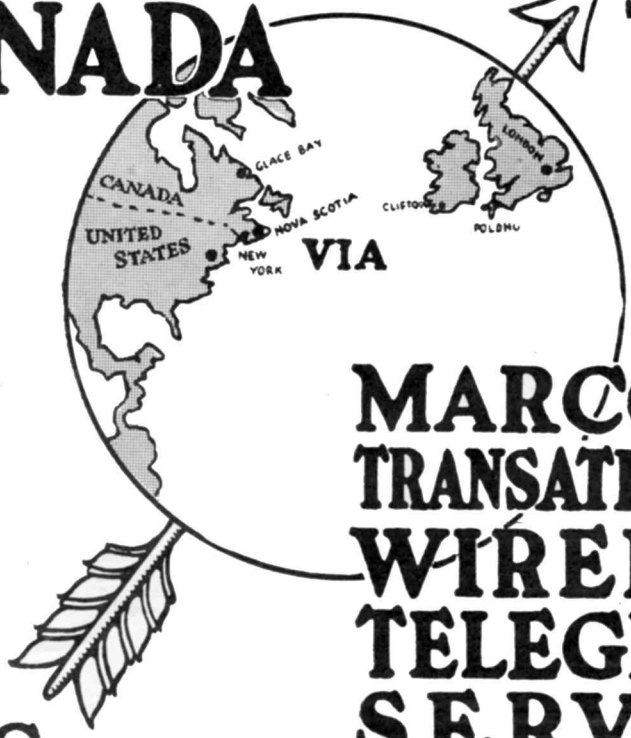

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THE MARCONIGRAPH

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Wireless in South Africa

THE annual report of the Postmaster-General of the Union of South Africa makes a somewhat belated appearance. Nevertheless, it is of exceptional importance inasmuch as it deals with wireless developments in the Colony, and demonstrates the utility of these services. The report states that the radiotelegraph station opened at Durban on June 13th, 1910, has proved of much service to the shipping community and the travelling public. The station has a minimum sea range during the day of 250 miles; but at night, when signalling conditions are greatly improved, communications are frequently exchanged with vessels at a distance of over 1,000 miles. At the time of installation only three vessels trading in South African waters were able to exchange signals with the station. The provision of wireless facilities at Durban, however, has led to a remarkable increase in this respect, and there were at the time of the preparation of the report thirty vessels fitted with wireless apparatus trading with, or calling periodically at, South African ports. Other vessels are being similarly equipped. Owing to the electrical current from the local supply in Durban being cut off at certain times, it has been necessary to import plant to generate current for use by the station during such periods. This should be working early in 1912.

Tenders for the erection of a wireless telegraph station in the Cape Province were called for in June, and it was decided to accept that of Marconi's Wireless Telegraph Co., Ltd., for the erection of a 5-kilowatt station, with a guaranteed minimum sea range of 400 miles by day, and from 600 to 1,000 miles by night. Arrangements were also made with the Marconi Co. to send out an expert engineer to advise the Government in the selection of suitable sites for wireless stations. This gentleman arrived in the Colony on October 11th, and at once proceeded to inspect various points on the coast line of the Cape Province. As a result of his recommendations it was decided to erect the first station at Slangkop, in the Cape Peninsula. A suitable piece of land on Government property for a station was selected, and the erection of an operating house put in hand by the Public Works Department. The installation of the wireless plant was commenced under the direction of the Marconi engineer, who remained in the country to complete the station. The Slangkop station has since been under tests by officials of the Cape Town Post Office for the purpose of ascertaining whether it was capable of transmitting signals over the distance specified in the contract entered into by the Marconi Co. These tests proved satisfactory, and the station has been taken over by the postal authorities. It is stated that at present there are no vessels trading in South African waters with installations equal in power range to that at Slangkop; but reports show that signals from the station have travelled and been read without difficulty over the minimum distance by day—viz., 400 miles. Signals have also been exchanged at night with vessels from 1,000 to 1,500 miles distant, and it has been reported that on occasions signals from Slangkop have been received by vessels 2,000 miles away.

MR. ADRIAN F. H. SIMPSON.

Adrian F. H. Simpson,

Managing Director of the Russian Company of Wireless Telegraphy and Telephony

THE words used by Vallentine about Proteus, "His years but young; his experience old," may fittingly be applied to the subject of our sketch this month—one of the young but brilliant coterie of coadjutors which the outstanding genius and magnetic personality of Mr. Marconi have gathered with irresistible force round the throne of his mighty discoveries.

Adrian Simpson is a son of Surgeon-General Sir Benjamin Simpson, K.C.I.E., and was born in Edinburgh in 1880. His early years were passed amid the cultured and inspiring influences of his native city, whence he went to Clifton College and then to the Royal Military College. Apparently he was destined for a military career, and shortly after the outbreak of the South African War he gained a commission in the British Army, being gazetted to the 31st East Surrey Regiment, then stationed at Lucknow. After a short service with this regiment he joined the Hyderabad contingent of the Indian Army. This step marked the opening of a varied and interesting career, which brought Mr. Simpson in touch with life in several countries and considerably enlarged his experience in dealings with men and the handling of affairs. He served first of all in the Bengal, Bombay, and Madras Residences; afterwards he was placed in command of a detachment of native troops in charge of one of the large camps in which were housed the Boer prisoners captured in the South African War; later he served on plague duty in Central India. He went to Russia in 1903 in order to learn that difficult language, and so proficient did he become in this subject that in the examinations for interpretership in the Army he gained the highest possible degree. Moreover, he obtained Government awards for proficiency in Persian and Hindustani, and to the linguistic laurels which he gained, by sheer merit and ability, must be added a knowledge of French. Mr. Simpson spent two years in Russia, and during that time he travelled extensively, his travels taking him from the Arctic circle to the Persian frontier. Indeed, the all-pervading *wanderlust* of the modern Anglo-Saxon seems to have absorbed him, for at various times he travelled in Cashmir, Finland, Norway, Sweden, Denmark, India, Russia, and elsewhere. In 1904, when the Armenian troubles were prevalent in the Caucasus, he succeeded in safely carrying the "Foreign Office Bag" from St. Petersburg to Teheran. He also realised that there was oil in the Caucasus as there was balm in Gilead, and he accordingly spent some months with a party of English engineers prospecting for oil in those regions.

In Mr. Simpson's subsequent career we discern a peculiar trace of heredity in the combination of scientific and military practice, although in the case of our subject it was the scientific practice that was superimposed upon an edifice of military training and travel. Leaving the service in order to make a thorough study of wireless telegraphy, Mr. Simpson commenced work with the English De Forest Wireless Telegraph Syndicate, Ltd., and continued afterwards with the Amalgamated Radio-Telegraph Co., Ltd. (owning the Poulsen Patents). During his service with the last-named company he obtained an excellent opportunity, of which he took full advantage, of studying wireless telegraphy, not only as practised in England, but also on the Continent, where he spent considerable time in Berlin and Copenhagen, becoming subsequently associated with the Lepel Wireless Telegraph Co., Ltd. Mr. Simpson's connection with Marconi's Wireless Telegraph Co., Ltd., commenced with the Field Station Department, but on the formation of the Russian Company of Wireless Telegraphy and Telephony he was appointed managing director of that company. His unique experience, his commercial and technical attainments, his extensive travels, his linguistic ability, and, last, but by no means least, his knowledge of the language and people of that interesting country, encourage highest hopes for the success of his new enterprise, which all who know his kind and courtly nature, and his sound judgment and energy, are confident of seeing the happy realisation.

Mr. Simpson is an Associate Member of the Institution of Electrical Engineers and a member of the Anglo-Russian Chamber of Commerce. When a Royal Commission sat during 1910 to consider trade relations between Canada and the West Indies, Mr. Simpson gave evidence regarding the practicability of connecting the West Indian Islands by wireless instead of by cable.

The Measurement of Condenser Losses.

By J. A. Fleming, D.Sc., F.R.S.

AN essential element in all apparatus for wireless telegraphy by electromagnetic waves is a condenser, and this appliance is required not only in the transmitting, but also in the receiving apparatus. In the transmitter the condenser is used to store up energy which is released periodically and expends itself in creating oscillations in the antenna, and therefore partly in radiated waves. At each release part of the energy accumulated in it is expended in heating the metallic circuit in which the condenser is inserted, another portion is dissipated in the spark-gap, a third in the condenser dielectric and plates, whilst of the remainder transmitted to the antenna, part is dissipated as heat in the antenna wire, some in the earth plate, and only a fraction sent out as energy of radiation.

As the energy dissipated in the condenser may be very considerable, it is desirable, therefore, to be able to measure it exactly, and to institute comparisons between different condensers in respect of their dissipative power. If we take precaution to prevent brush discharges, it is found that even then a not inconsiderable loss occurs in the dielectric. Some loss must exist in the metal plates, due to the current passing into and out of them at every oscillation. Experiment, however, shows that for condensers with air as dielectric the loss is very small provided that the metal plates are made of good conducting material with rounded edges and corners so that all brush discharges are prevented. A very useful type of air condenser for experimental purposes is one consisting of a number of fixed semi-circular metal plates, one above the other, and a similar set attached to a rotating shaft so that the movable plates can be inserted more or less between the fixed ones and vary the capacity. Condensers of this kind with air as the dielectric, called variable air condensers, are very useful in the radiotelegraphic laboratory. By the aid of a couple of such condensers of suitable capacity we can make a determination of the energy loss in another condenser of a similar capacity, but with dielectric of some solid or liquid substance.

The necessary arrangements are as follows: An induction coil, I (see illustration), is excited with steady alternating current, and the secondary terminals are connected to a condenser, P C, spark-gap, S, and primary inductance coil, Pr. The condenser may consist of one or more Leyden jars, the inductance of a few turns of wire wound on a square wooden frame, and the spark-gap, S, must be an impact spark-gap, preferably of flat, closely-adjacent steel plates rotating in oil, as described in the author's British Specification (Fleming No. 23,242 of 1910).

At a distance from the above-mentioned primary coil, so as to be very loosely coupled with it, is placed a secondary coil of the same kind, consisting of a few turns of wire on a square wooden frame. This secondary circuit is completed by the condenser, C, under test, placed in series with another movable-plate air condenser, C_1, also a second movable-plate air condenser, C_2, is so arranged that it can be substituted for the condenser, C, under test. Two other appliances are inserted in the secondary circuit—viz., a hot wire thermo-electric ammeter, A, of the kind provided for the Fleming cymometer, which consists of one or more fine Constantan wires through which the current to be measured passes, and an iron-nickel thermojunction of fine wires which is soldered to one Constantan wire. This ammeter is calibrated by connecting the ends of the thermojunction to a low resistance Paul single pivot galvanometer, and measured direct currents from a storage cell are then passed through the Constantan wire and the deflections of the galvanometer noted.

This continuous current then gives us the root-mean-square value of any high-frequency current, which, when passed through the Constantan wire, gives the same deflection on the galvanometer as the direct current. Likewise a sliding wire resistance, R, made of a pair of fine Constantan wires, is inserted in the circuit.

The condenser under test, C, may be considered to have its energy-dissipating power represented by a certain internal resistance which we will call r, which is in series with a capacity equal to the true condenser capacity. When the condenser is placed in an oscillation current, the time period of oscillation or frequency depends almost entirely on the true capacity, but the damping or decrement of the oscillations is affected by the resistance, r, of the condenser. The power factor of the

condenser for a certain frequency, n, is very nearly given by the product, $2\pi nCr$.

Condensers with relatively large power factor are thus disadvantageous for use in wireless circuits compared with condensers of small power factor, because they create a relatively large decrement.

The process of measurement, then, is as follows. First, oscillations are set up in the primary circuit by means of the induction coil, and the secondary circuit is adjusted in such loose coupling that there are in it oscillations of only one frequency. It is advisable to use an impact discharger for this reason.

We then insert the condenser, C, in the secondary circuit and vary the capacity, C_2, and also that in the primary circuit until the two circuits are in tune and the frequency, n, has any desired value. Then observe the current, A, as read on the hot-wire ammeter.

Next substitute for the given condenser, C, the movable-plate air condenser, C_1, and vary its capacity until the current, A, has a maximum value. Also vary the sliding resistance, R, until the current has the same value it has when the condenser, C, is used.

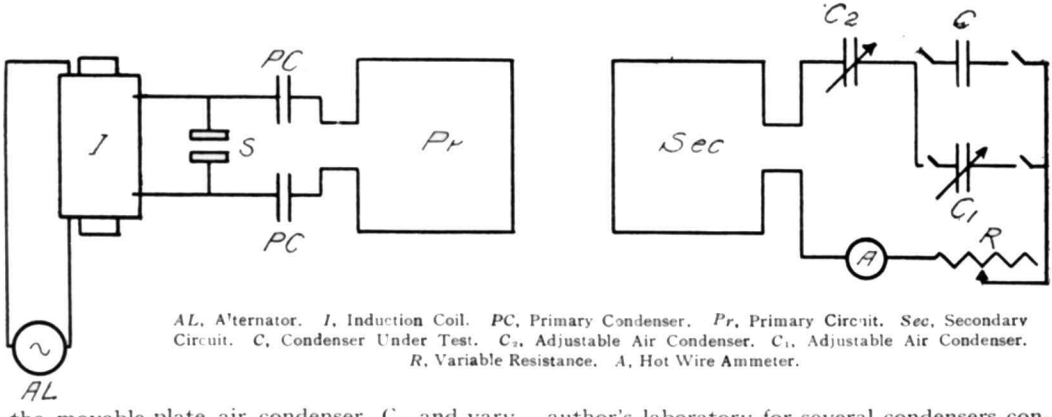
We have then substituted for the capacity of the condenser under test the equal capacity of a non-dissipative air condenser, and for the internal resistance or source of energy dissipation in the first condenser we have substituted an external resistance, R, and have the same current in the two cases and the same frequency. Hence the decrement must be the same.

Therefore the energy loss in the condenser, C, under test, is given by the value of A^2R where A^2 is the mean-square condenser current and R is the external resistance. Also the power factor is given by $2\pi nRC$ where C_1 is the equivalent air condenser capacity. The potential difference of the condenser terminals is given by 1000 $A/2\pi nC$, assuming the current to be measured in milliampères and the capacity in microfarads.

The chief difficulty which presents itself in this method is that of obtaining variable air condensers of sufficiently large capacity without undue bulk. On the other hand, if the plates of the air condensers are brought very near together the voltage which can be employed is necessarily low.

Moreover, if high voltages are employed, then brush discharges begin to appear at the edges of the plates, and we can no longer assume that the air condenser losses are negligible.

The above described method is, however, very suitable for measuring the loss in condensers intended for use in the receivers of wireless telegraphic apparatus, because the terminal voltages are then always low. Employing this method, the following measurements were made by Lieut.-Comm. S. Kurose in the author's laboratory for several condensers constructed with ebonite and glass dielectrics.



AL, Alternator. *I*, Induction Coil. *PC*, Primary Condenser. *Pr*, Primary Circuit. *Sec*, Secondary Circuit. *C*, Condenser Under Test. C_2, Adjustable Air Condenser. C_1, Adjustable Air Condenser. *R*, Variable Resistance. *A*, Hot Wire Ammeter.

Frequency used $=n$.	Capacity in mfds. of Condenser $=C$.	Current through Condenser in Milliamps. $=A$.	Equivalent Resistance of Condenser in ohms $=R$.	Condenser P.D. in Volts.	Power Factor
$0{\cdot}64\times10^6$	0·000865	44·3	3·35	12·9	0·012
	0·001650	59·5	1·60	9·0	0·011
	0·002495	55·0	1·22	5·5	0·012
	0·003760	71·0	0·85	4·7	0·013
	0·004230	68·0	0·65	4·0	0·011
	0·005323	72·0	0·50	3·4	0·011
$1{\cdot}48\times10^6$	0·000715	65·5	1·48	9·8	0·010
	0·001615	66·5	0·99	4·4	0·015
	0·002510	72·0	0·55	3·1	0·013
	0·002870	67·0	0·37	2·5	0·010
	0·003175	65·0	0·33	2·2	0·010
II.—Glass Plate Condenser.					
$1{\cdot}49\times10^6$	0·00046	66·5	1·28	15·4	0·005
$1{\cdot}90\times10^6$	0·00046	67·0	0·87	12·2	0·005
III.—Moscicki Condenser.					
$0{\cdot}64\times10^6$	0·00174	68·0	1·69	9·7	0·012
$0{\cdot}92\times10^6$	0·00174	68·0	1·52	6·8	0·015
$1{\cdot}43\times10^6$	0·00174	72·0	1·28	4·6	0·020

I.—Ebonite Plate Condenser.

It will be seen, therefore, that in the case of the ebonite plate condenser the power factor

is about 1·0 to 1·5 per cent., whereas in the glass-plate condenser used it was only 0·5 per cent., and in the Moscicki condenser rather more than 1·5 per cent.

The terminal-potential difference of the condensers used did not exceed a few volts, hence we cannot draw conclusions from these experiments as to the loss in transmitter condensers where the condenser P.D. is much higher. In this last case there is generally considerable energy loss due to brush discharges from the edges of the metal plates. This is to a large extent prevented by immersing the condenser plates in oil. Even then, unless the metal connectors are carefully designed, brush discharges may take place on the exposed portions.

It is for this reason desirable to employ air-condensers whenever possible, both in the receivers and in the transmitters of wireless telegraph apparatus.

In the case of transmitters the chief objection to the use of air condensers is their bulk, but this objection does not hold good for the receiver condensers. It must be remembered that as the energy picked up by the receiving antenna in any case is small, it is desirable to conserve it as much as possible, and if sharp tuning is desired to prevent by every possible means undue damping of the oscillations in the receiver's circuits. This is assisted by bestowing great attention upon the construction of the condensers, and selecting carefully the material used as the dielectric.

Wireless and Weather

THE next time a storm attacks the American shores the weather bureau at Washington will be ready and waiting for it. Wireless telegraphy is the means whereby the weather bureau is to keep its "eye" on the storms, the rains, and the fair weather that rise from the coast; and Atlanta, like other stations, will henceforth obtain advice by wireless of the kind of weather it is to expect.

News of this new effort by the weather bureau has been made public by the announcement from Washington, which was referred to in the December MARCONIGRAPH, that the Secretary of the Navy had directed some of the Government's wireless stations to keep in touch with all ships passing at sea for the purpose of getting information about the weather off shore. This news will then go by telegraph to the inland stations. Frequently it has been proposed that the Government should build observatories on islands off the coast for the purpose of keeping informed of the condition of weather at sea. But wireless telegraphy has superseded this idea. Conversations with passing ships seem to be an even better way.

The condition of the weather off the coast is an influence of utmost importance to weather conditions ashore. But hitherto it has been an element largely mysterious, with which the forecasters have reckoned principally by shrewd guessing. Often a dangerous storm arises there, and sweeps in to the coast before the weather bureau knows what is the matter. This is what happened at Charleston recently. But now the bureau believes it will be able to tell how the weather goes at sea, and what is to be expected on land. When throwing a "Good morning" to passing ships, the wireless stations will always add, "How's the weather?"

By more accurate forecasts of heavy rains, cold waves, or storms from the sea, the bureau believes it will be able to save many thousands of dollars to farmers, manufacturers, and other investors.

Long-distance communication in wireless telegraphy has been established at Mare Island, U.S.A., where the new high-power station carried on communications with Unalaska, 2,030 miles to the north. While communication at this distance has been possible before in the night, it is longer than any ever recorded in the daytime.

The wireless experts at Mare Island have been trying daily to establish new long-distance records since the new high-power plant was installed. The poles, which are 300 ft. high, are 400 ft. apart, and all the apparatus is especially constructed for clear talk over long distances.

The naval station at Unalaska was recently damaged by a terrific wind.

The Turco-Italian War; A Dramatic Incident

ON October 15th last, at 6 p.m. local time, the Marconi engineer at the Athens station happened to be standing by and listening on the magnetic detector, when he heard the following message come through in English:

"To Derna, Derna, Derna; leave the station. In ten minutes we shall destroy it.—ITALIAN ADMIRAL."

The message was repeated three times, after which there was silence.

Derna, on the Tripoli coast, is about 320 miles S.S.W. of Athens.

Telegraphic Communications in Spain

Notable Success of Marconi Stations

NOVEMBER 28th, 1911, should prove to be a red-letter day in the history of Spain, which then became one of the most important of European countries in regard to the transmission of messages by wireless telegraphy. On that day were opened four of the largest stations which Marconi's Wireless Telegraph Co., Ltd., erected and equipped in Spain on behalf of the Compañia Nacional de Telegrafia sin Hilos. Various references to this great undertaking have appeared in previous issues of THE MARCONIGRAPH, and the newspapers all over the world have during the past few days spoken in unmeasured terms of praise of the unqualified success of the work. It is therefore opportune to describe more fully the stations that have been opened, and the important services which they will render.

The first four stations—namely, those at Cadiz, Teneriffe, Las Palmas, and Barcelona—were actually completed at the end of last July, but until they had been inspected and very thoroughly tested by the Spanish Government Commission they could not be opened for public service.

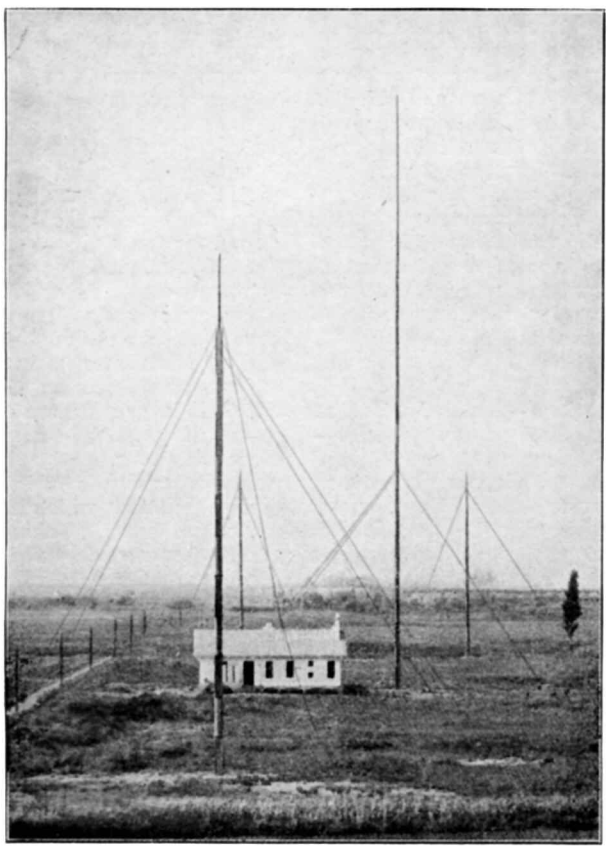
The first station visited was Cadiz, and after preliminary inspection of this station the Commission, accompanied by the representative of the Marconi Wireless Telegraph Co. and the chief engineer of the Compañia Nacional de Telegrafia sin Hilos, left for Teneriffe. Here a further preliminary inspection was made, and the Commission proceeded to Las Palmas to carry out the full inspection of that station. Further exhaustive tests were conducted during twenty-four hours between Las Palmas and Cadiz and Teneriffe and with ships at sea, and Senor Camino, the head of the Commission, expressed himself as astonished not only with the reliability of the service, but also with the speed and ease with which communication was carried out.

After the inspection of the Las Palmas station, two members of the Commission were left at Las Palmas, and two proceeded to Teneriffe, where another exhaustive inspection and continuous series of tests, lasting many days, were carried out. Communication was effected throughout day and night, and at no time was there any interruption of the service, although, as is well known, atmospherics become more troublesome the nearer the station is erected to the equator. After the inspection of these two stations, one member of the Commission was left at Las Palmas, one at Teneriffe, and the two senior members proceeded to Cadiz, where further exhaustive tests were carried out, messages being sent between the various members of the Commission at the different stations every hour of the day. On one occasion there was a short delay of an hour in getting a message through, due to an exceptionally violent thunderstorm, but at the same time cable communication was interrupted for ten hours owing to the same cause. The Commission expressed themselves as extremely satisfied with these three stations in every detail. They then proceeded to Barcelona, where further trials were carried out, communication being established with the utmost ease between Cadiz and Barcelona, which is a greater range than the company contracted that the stations should be capable of working over.

It will perhaps be of interest to describe each of these stations which have now been opened in more detail. Taking Cadiz first. This station is situated at the side of a road about 4 kilometres from the town of Cadiz, and about 100 yds. from the sea. The station consists of a large stone building provided with ample accommodation for the power plant, and also for the staff. It was originally erected by a French company, who put up the building and the four towers, and also installed their wireless system; but they were unable to establish communication between Cadiz and the Canary Islands, and the problem for the Marconi company was to utilise as much of the power plant as possible, and replace the French company's wireless apparatus with Marconi wireless apparatus.

It will be readily understood that it is easier to design a completely new station to communicate over the long distances required than to utilise the existing conditions and alter the wireless design to conform with the details already established. In the case of the Cadiz, as in the Teneriffe and Las Palmas stations, there are four towers placed in approximately a square of 90 metres, these towers being 238 ft. high, supporting an aerial of 15 wires, the engine-room plant consisting of an engine driving by means of a belt a dynamo direct-coupled to an alternator. The direct-current

machine serves as a dynamo to charge a large battery of accumulators. It also serves as a motor, taking its current from the accumulators to drive the alternator supplying power to the wireless plant. The alternator is of 25-kw. capacity, 150 cycles, and 1,000 r.p.m., the voltage being 350/400. The station is supplied with a disc driven by a separate motor, and a speed of 800 r.p.m., and gives a note of about 320. The wave length of the station is 2,540 metres. The receivers supplied to this station are of the valve type for the long-distance communication, and a magnetic detector is supplied for communication with ships on the short wave. This station is also supplied with a separate 3-kw. plant for communicating with ships on the 600 and 300 metre wave length.



The Barcelona Station (Prat de Llobregat).

Cadiz is an old-world town, with many traces of the Moorish occupation. The climate is equable, and except for the disagreeable winds that blow there at times, the place is a pleasant one to live in. The facilities for the staff of the station are very good. The living quarters are comfortable, and as the trams pass the door of the station the staff are not in any way isolated.

It is worthy of mention that the Cadiz station has been in direct communication with Poldhu, and messages of a congratulatory nature were despatched by the Inspecting Commission to the head offices of the Marconi Wireless Telegraph Co., Ltd., in London, *via* Poldhu.

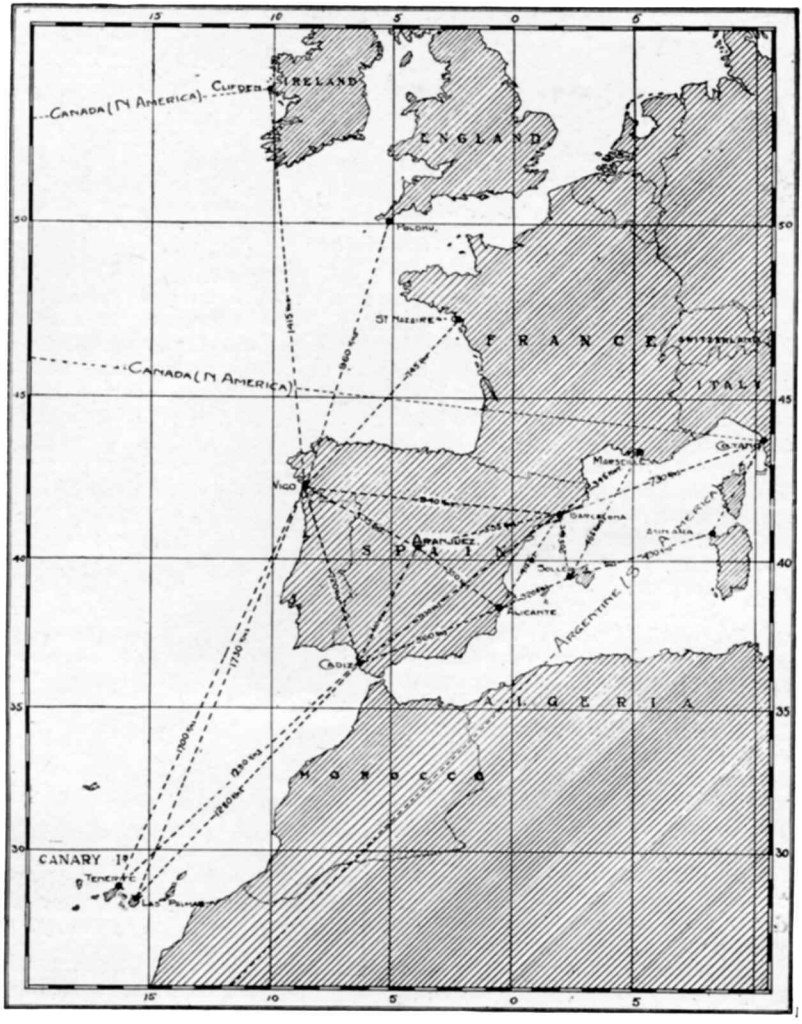
Las Palmas station is situated on the south-east corner of the island of Grand Canary, about 17 miles from the town of Las Palmas. The building is of a more imposing character than at the other stations. The situation of the station is at Point Melenara, on the rocks. This building is of stone and ferro-concrete, and the living quarters for the staff are very commodious. There are two storeys, the upper having a separate entrance, and comprising the living quarters of the operators. In the lower storey the power plant and wireless equipment are situated, and also the living quarters of the engineer-in-charge. The station, in other respects, is similar to that at Cadiz.

Teneriffe station is erected in the town of Santa Cruz, on the island of Teneriffe. The site of this station, as in the case of Cadiz and Las Palmas, was designed by the previous contracting company, by whom also the towers were erected. At this station great difficulty was experienced in obtaining a satisfactory earth, as the whole of the site consisted of lava, the island being of volcanic origin. The difficulty was overcome, however, by sinking a long trench 150 metres long and 2 metres deep, and burying galvanised iron plates to which the connections were made by means of radial wires. The power for this station is obtained from the power station of the town of Santa Cruz, and is used for driving a motor direct-coupled to an alternator. In addition to this source of supply, an oil engine has also been installed for the purpose of having an alternative source of supply in the event of an accident occurring in the power-house of the town, or on the line between the town power station and the wireless station.

Santa Cruz is a delightful spot for those fortunate enough to obtain their living there. As is well known, it is the resort of many tourists who wish to avoid the rigours of the English winter. Mountains surround the town, and these are really extinct volcanoes. The trouble encountered here is lack of rain. At the time of leaving the island no rain had fallen for nine months, and the difficulty of obtaining an effective earth can easily be imagined.

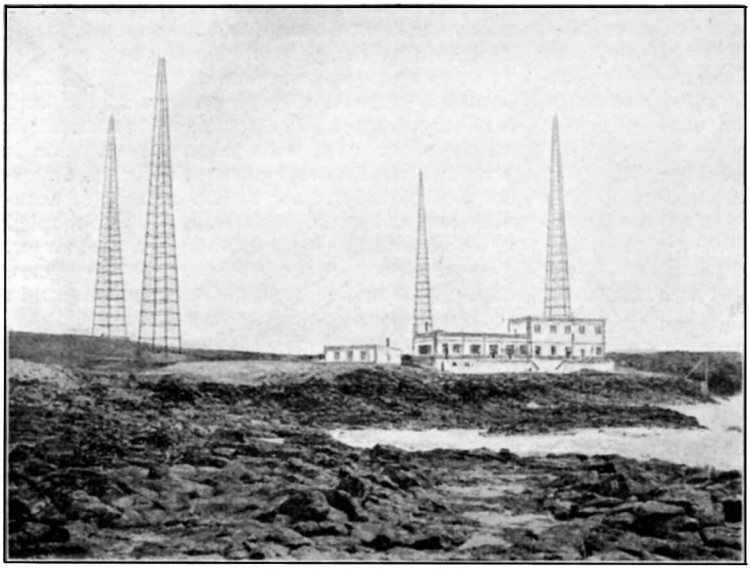
Considerable difficulty was experienced in finding a suitable site for the erection of the Barcelona station. According to the conditions of the contract, the station was to be in the town itself, but no suitable land could be found at a reasonable price. It was necessary, therefore, to go outside the boundaries of the town and obtain permission from the Spanish Government for the site selected. A suitable site was found in the village of Prat de Llobregat, about eight miles outside Barcelona. The River Llobregat forms a delta on the south side of Barcelona, on two sides by high mountains, and on the other side by the sea. This delta is under very high cultivation, filled with orange, fruit and vegetable farms. The roads are not worthy of the name, and at certain seasons of the year the river overflows its banks and the whole of the delta is under water. For this reason the buildings are erected on arches, the lowest rooms being above the highest level to which any flood has yet risen. The building for the wireless station is also erected on this principle, and has a rather attractive appearance. This building is constructed of brick and iron, with a tiled roof, and is of two storeys, bedrooms and bathroom being on the upper storey, and engine and power-house on the ground storey.

This station is provided with five masts, the centre mast 280 ft. high, and four outside masts 130 ft. in height, the aerial being of the "T" type, six wires on each arm of the "T." There is also a separate aerial for the receiving, and another separate aerial for the communication on the short wave with ships. The station is provided with a heavy type oil engine, direct-coupled to a dynamo, with a battery of accumulators and a motor generator direct-coupled to the latest type of rotating disc discharger. The frequency of the generator is 150 cycles, and there are eight full-sized condensers in



Map showing the newly opened Spanish Stations, and the Coltano Station, and their connections.

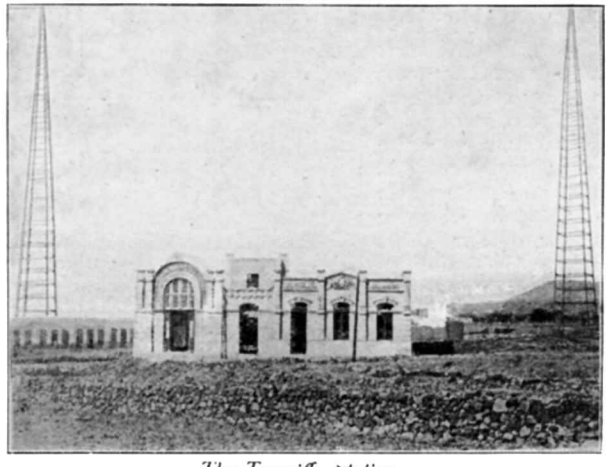
galvanised iron tanks for the long wave plant. The short-wave plant consists of four tanks, and obtains its power from the long-wave plant condenser circuit. The switchboards are fixed in the operating room, in which is also situated the receiving apparatus. Both valve and magnetic detector receivers are supplied. The masts are of the tubular sectional steel type, and set in blocks of concrete, the foundations of which had to be piled on account of the softness of the soil. The foundations for the buildings had in like manner to be piled. A large tank has been erected, 15 metres from the station, for a supply of fuel for the oil engine.



The Las Palmas Station.

The importance of the service which will be offered by these four stations cannot be over-estimated. The geographical position of Spain, commanding as it does the entrance to the Mediterranean, ensures that the stations on the Peninsula will obtain the bulk of the traffic passing in and out of the Mediterranean. The stations in the Canary Islands are on the main route to South Africa, Australia, and South America, and the fact that these stations can also communicate direct with Europe ensures that they will be utilised by the steamers plying on these great trade routes for communication to and from the rest of the world.

It now remains to describe the services for which these stations are intended. A glance at the map will at once show their importance for oceanic traffic between Europe and South America and South-West Africa. Barcelona will be in easy communication with the newly-opened station at Coltano, on the Gulf of Genoa, which is the largest in the world, and from which it is expected that messages can be sent to places upwards of 15,000 miles distant. The Cadiz station will communicate with the Canary Islands, with the central station also erected by this Company at Aranjuez, near Madrid (this station is now completed), with Barcelona and with ships at sea, and also with Vigo (the station at Vigo is also completed). The stations at Teneriffe and Las Palmas, in common with Cadiz, have a range of 1,600 kilometres, and will render service of primary importance to shipping. As is well known, the Canary Islands lie on the great routes to South Africa and South America, and a very large number of liners and freight vessels call at the ports in these islands. Besides the ships that call, there are other liners which pass the island without putting into port. On a voyage from South America, until these stations were



The Teneriffe Station.

opened, ships did not come into communication with a wireless station on the Mediterranean route until they had passed the Spanish coast, and on the northern route until they got into communication at Ushant. With the Teneriffe and Las Palmas stations, ships coming from America, and also from South Africa, can get into communication about a week earlier than was the case before the Cadiz and Teneriffe and Las Palmas stations were opened.

In addition to the large number of messages that are likely to arise from the ships on this trade route, there will also be a considerable business between the Canary Islands branches of British and other European houses and their headquarters, and, of course, ships calling at the Canary Islands ports will readily wish to communicate with their agents in the island before reaching port.

Hitherto, ships on the South African route, after they had lost touch with Ushant, were out of all communication by wireless except through the medium of passing vessels, until they got into touch with the station at Cape Town—that is to say, after two or three days from home waters the ship was unable to communicate or know what was happening in the world until she was approaching Cape Town. With the establishment of these stations, however, a ship can have constant communication for nine or ten days on its outward voyage to the Cape. Those who have voyaged to the Cape will realise what it is to be without news for such a long period, and what a boon consequently the establishment of these stations will be. The Barcelona station is intended for communication between Barcelona and Marseilles, Balearic Islands, Italy, Aranjuez, and Vigo. On the tests carried out at Barcelona, communication was established between Barcelona, Vigo, Cadiz, and Coltano, in Italy. Barcelona is also open for communication with ships in the Mediterranean between the Italian coast and the coast of Spain. Here, also, the stations satisfy a great want, and it can be confidently relied upon that a very considerable amount of traffic will be handled at this station.

No mention has been made in this article of the interior and international traffic that will probably arise between the various towns where stations have been erected; but it is undeniable that these stations could compete very successfully against the existing system of telegraphy, both as regards rapidity of service and reliability. The four stations now opened are only part of the general wireless scheme for Spain. There are four others, either completed or in course of construction, in other parts of the country. These four are situated at Vigo, Aranjuez, Soller in the Balearic Islands, and Alicante. Three of these—namely, Aranjuez, Vigo, and Soller, are now completed, and the inspection of these stations by the Spanish Government Commission is to take place immediately. When these other stations are opened they will form the subject of another article on the Spanish undertaking.

The engineers in charge of the stations that have been completed—namely, Mr. Marden, Mr. Eisler, and Mr. Dobell, have carried out their work in a very satisfactory manner, which has resulted in convincing the Inspecting Commission of the Spanish Government that wireless telegraphy is a commercial success. Until the Commission had seen the working of the stations and the service that they were capable of performing, they did not believe that wireless telegraphy could offer anything but an unreliable service, and could not in any way compete in point of view of accuracy, speed, or reliability with the service given by a cable. We are glad to say that the opinion of the Commission has completely changed, and they have expressed their great satisfaction with the service rendered by the stations.

Notes from Greece

THE beginning of December saw the completion and handing over to His Hellenic Majesty's Government of the Athens Naval Wireless Telegraph station, an article on which appeared in the August issue of THE MARCONIGRAPH.

The official trials of the Athens station took place with the Greek cruiser "Spetsae." The actual distance over which the test messages were transmitted was 380 miles, the whole of the mountainous Peloponnesus peninsula intervening between the warship and the land station.

Lieut. Athanasiades, of the Greek Navy, has been relieved of the charge of the Athens station in order to write a book on wireless telegraphy for use as a manual of instruction for naval officers undergoing the "W.T." course at the Navy yard. Sub.-Lieut. Gonotas has temporarily been placed in charge of Athens station, vice Lieut. Athanasiades.

The Greek Government has entered into negotiations with the Marconi International Marine Communication Company with the object of sending a number of Greek naval petty officer telegraphists to England for the purpose of going through a course of instruction at the company's Liverpool school.

Vice-Admiral Lionel G. Tufnell, C.M.G., Naval Adviser to the Greek Government, reports that the eight torpedo boat destroyers recently equipped with the company's 1½ kw. sets are doing excellent work.

From Official Sources

Legislation Recommended in the United States.

General James Allen, chief signal officer of the United States Army, draws attention in his annual report to the failure by the Senate to confirm the adherence of the United States to the Berlin Wireless Telegraph Convention, and the fact that it is only through courtesy or by some private arrangement that American ships can communicate with wireless stations in foreign countries. General Allen also refers to the great confusion that now exists in the transmission of wireless messages on the coast of the United States, seriously interfering with communication between various coast defences and ships at sea, and urges the necessity of legislation to provide adequate control of all wireless telegraph operations with special regulations for war conditions.

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Indian Developments.

Several items of interest from a wireless point of view appear in the Administration Report of the Telegraph Department of the Government of India for last year, issued recently. For instance, we learn that the special surtax of four rupees per message on radiotelegrams exchanged between Calcutta and the pilot vessel at the Sandheads (the Sandheads is the pilot station at the mouth of the Hooghly, where all vessels proceeding up river to Calcutta take pilots aboard) was abolished, with effect from July 2nd, in favour of the usual rates for inland telegrams. This concession, granted by the Government of India in favour of wireless telegraphy was, doubtless, much appreciated by the people of India, especially the mercantile community of Calcutta, to which it must prove a great benefit. Then the Report states that a radiotelegraphic station having been opened at Bombay for the exchange of messages with ships at sea fitted with radiotelegraph apparatus, at first merely as an experiment, it was found that the system was so successful that it was decided to open this station as well as stations at Diamond Island, Sandheads, Table Island, and Victoria Point, for international wireless traffic. We are informed, however, that the radiotelegraph stations at Bassein (in Lower Burma), Mergui (a group of small islands lying just off the Tenasserim coast, at the extreme end of Tenasserim, where it connects with Siamese Malaya), and Port Blair (the chief station in the Andamans, India's great convict station), are not open at present for ship-to-shore communication, except in cases of distress. Further we learn that the most important event of the year (1910) in radiotelegraphy, was the placing of a contract with the Marconi Company for three stations with a range of 600 miles at Calcutta, Allahabad, and Delhi, and one station at Simla (Jutogh), with a range of 300 miles. Regarding the working of wireless stations in India, the Report says: "During the cold weather season, and at night, communication was effected over very long distances with the existing small power stations. The stations at Calcutta and Bombay were able to converse on two or three occasions. At Calcutta, the signals from the German cruiser 'Gneisenau,' on her voyage from Colombo to Bombay, were heard every night, and very frequently signals were heard from vessels voyaging between Colombo and Singapore. At the Sandheads it was reported that signals were received from Jask (Persian Gulf). The stations at Bassein and Diamond Island, in Burma, have, at times, read the signals from Bombay, while the latter station has sometimes heard the signals from his Majesty's ships in the neighbourhood of Hongkong. These phenomena, though interesting, are of no immediate practical value, and the extraordinary distances over which radiotelegraph signals can be read, has been observed at most radiotelegraph stations in both hemispheres."

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Services and Charges in Spain.

His Majesty the King of Spain has, through the Minister of the Interior, authorised the creation of a new branch of the State Posts and Telegraphs Department under the title of "Radiotelegraphy." This department will be concerned with all matters appertaining to the wireless telegraphic services, and it is charged with the establishment of a school of wireless telegraphy in Spain.

An official order, dated November 24th, states that His Majesty the King has been pleased to command the opening of the wireless stations at Teneriffe, Las Palmas, Cadiz, and Barcelona, in accordance with the request of the Compañia Nacional de Telegrafia sin Hilos. The stations are further authorised to perform the following services of communication: (1) Communication from the land stations to ships at sea, and *vice versa*; (2) international service with foreign countries; (3) service between the Peninsula, Canary, and Balearic Islands, and *vice versa*; (4) interior service between the stations of the Peninsula. The

taxes for the maritime service are as follows: The coast tax is 0.45 pesetas per word, with a minimum of ten words. The Spanish ship tax is 0.30 pesetas, with a minimum of ten words. The ordinary land line charge is to be added to every radiotelegram. The tax for foreign ships and countries is in accordance with their respective regulations and the Berne Bureau list. The rates between Spanish stations and foreign ships and countries are to be paid in francs. The rates for the other services will be published in due course.

King George and Wireless

WIRELESS telegraphy is truly making history. We recorded in our issue of last month the preparation of the *Court Circular* for the first time by means of wireless, and referred to the striking wireless communications which were maintained between King George and this country while the former was on his way to India on board H.M.S. " Medina." The continuous exchange of messages, many of them of great State importance, between the King and his ministers, and the King and other monarchs and foreign dignitaries, under the conditions mentioned, is not only remarkable testimony to the reliability of the Marconi system of wireless telegraphy, but is a proof of the confidence which this system has firmly established in the highest quarters, and it is a fitting compliment to the brilliant achievements which Mr. Marconi has won in other fields. The issue of a *Court Circular* from information telegraphed from mid-ocean, many thousands of miles away from the seat of publication, and recording events almost on the day following their occurrence, is an incident which, it would be reasonable to suppose, would occupy an unparalleled position on the pages of history for many a day. But wireless telegraphy does not stand with isolated victories to its credit. The marvel of one achievement had scarcely ceased to engage men's minds before another arose—one fraught with even greater significance. The newspapers on the morning of November 29th contained the announcement that " the King had been graciously pleased to offer a peerage to Sir Arthur Wilson. . . ." Behind the prosaic form of this announcement was something to kindle the imagination, and to charge the dry bones of Court formality with the romance of Mr. Marconi's great victory over Nature. King George was, at the time the announcement was made, somewhere midway between Aden and Bombay. What means, other than wireless, could His Majesty adopt to make known his gracious wish? This is probably the first occasion on which a peerage has been offered by wireless telegraphy, and certainly the first on which such an offer has been transmitted from Asia to Europe.

The King and Queen were very deeply interested in the working of the wireless installation on board the " Medina," and his Majesty tried his skill at sending a message, which reached the Admiralty headquarters at Whitehall almost perfectly.

It has transpired that the King, on board the " Medina," when between Aden and Bombay, was informed of the trend of Sir Edward Grey's historic speech in the House of Commons on the Morocco question by wireless telegraphy.

Progress in India

ON the night of November 29th, the newly opened Marconi station at Delhi, which was described together with other stations in India in the December issue of this journal, successfully transmitted the following msesage to H.M.S. " Defence " over a distance of 1,350 miles:

> " Marconi's Wireless Telegraph Co., Fort Delhi, humbly beg to offer His Majesty their most loyal greetings on his approach to India—transmitted direct from Delhi by wireless."

This is probably the first message to reach a British battleship direct from India.

The extension of wireless telegraphy in India is now to be carried out systematically. A route from Calcutta to Jutogh, Simla, by way of Allahabad and Delhi, was chosen in the first instance, and the installations are nearing completion. The next station to the north will be at Lahore, and this will be put in touch with Karachi. Later on Peshawar will doubtless be included in the system. In the west an installation is to be given to Bombay and another to Nagpur. Necessary funds will be provided during the course of this year.

The Johannesburg *Evening Chronicle* refers to the following interesting communications from Slangkop with certain vessels at 9 a.m. on November 24th, 1911, some of the distances covered being remarkably good:

615 miles, " Briton," N.W., outwards.
680 miles, " London," N.W., outwards.
990 miles, " German," N.W., outwards.
370 miles, " Dover Castle," N.W., inwards.

Atmospherics in Southern Latitudes

BY C. A. OLIVER

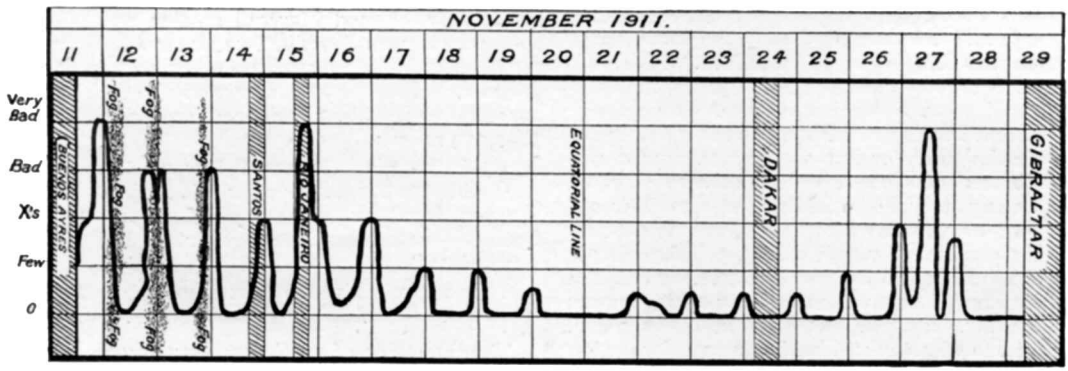
TO those interested in the solving of the atmospheric problem the accompanying graph will be of interest. It shows—as accurately as a small chart can show—the atmospheric trouble encountered during a voyage of the s.s. "Argentina" from Buenos Ayres to Gibraltar in November last.

During the greater part of the week prior to the departure of the vessel from Buenos Ayres, considerable trouble was experienced from "atmospherics," and it was impossible to work over other than very short distances. This is explained by the furious storms raging in the neighbourhood, which so charged the air with electricity that for the greater period atmospherics were quite continuous, and sparks could be obtained in the wireless cabin on board the "Argentina." The atmosphere cleared a little, however, when the vessel left the port. From 4 a.m. to 5 a.m., lasting sometimes till mid-day, there were practically no "X's." But even during these periods of calm the atmosphere seemed rather dense, and none but ordinary distances could be bridged. By the time Rio de Janeiro was reached the barometer had risen from 29·3 to 29·4.

From Rio de Janeiro to the equatorial line the ether became perceptibly clearer every day, and any "X's" that were encountered were generally weak, only interrupting fairly long-distance communications. By this time the barometer had risen to 29·5, and on the actual night of crossing the equator, though the atmosphere seemed "dense," there were no "X's" at all. On the way to the Canary Islands the ether was remarkably free from electrical disturbances, the one or two "X's" which occurred being mainly due to the lightning flashes of passing storms. The barometer rose to 29·6, but dropped a little during a storm encountered near the Canary Islands. This accounts for the graph line shown for November 27th. On the night before reaching Gibraltar there was no atmospheric trouble at all, this being the second perfectly clear night experienced during the voyage, but with this difference—that whereas on the first night the atmosphere seemed "dense," on the second it was distinctly clearer, and communication with other ships was possible over great distances. The signals from Ushant were specially noticeable.

The barometer reading while passing Gibraltar was 29·7.

A glance at the graph will show that the farther north the ship proceeded the better became the atmospheric conditions. The barometer rose from 29·3 to 29·7, which would seem to indicate that the atmospheric disturbances encountered in the southern latitudes were mainly due to local storms.



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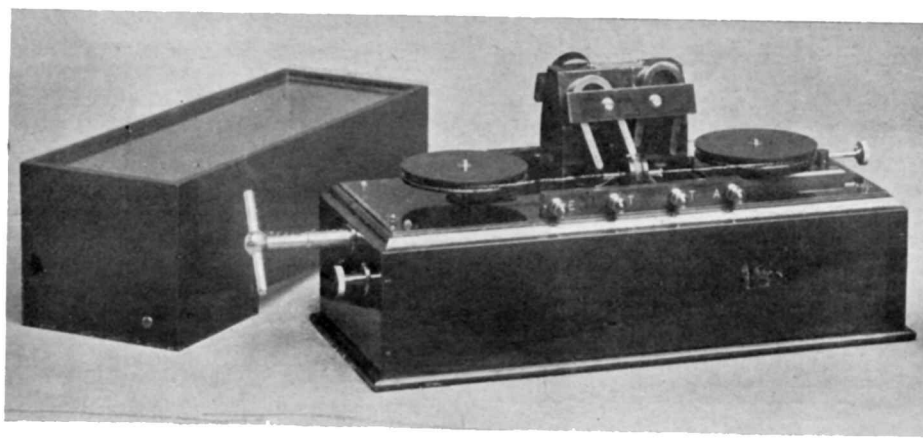
The disappearance of a clergyman holding a Court appointment brought wireless into play in a manner which affords yet another example of its remarkable utility. Mr. R. H. Davis, a celebrated American author, was crossing the Atlantic in response to an urgent message from his sister. He little knew the reason for this call until one evening, when the vessel was out at sea, Mr. Davis received a wireless message from his brother intimating that the New York evening papers announced the cancellation of their brother-in-law's Court appointments in England. Then he understood why his sister had sent so urgent a message.

Some Marconi Instruments at the Physical Society Exhibition

THE Seventh Annual Exhibition of Electrical, Optical, and other Physical Apparatus, held under the auspices of the Physical Society of London, on December 19th, attracted an interesting collection of modern instruments. Messrs. Marconi's Wireless Telegraph Co., Ltd., had a stand which attracted considerable notice. The decremeter came in for a good deal of attention. The special function of this instrument is to measure the rate of decay of electrical oscillation amplitude in high-frequency circuits. The instrument also measures wave-length, coupling, capacity, self and mutual inductance. For both decrement and wave-length it is direct reading. A wavemeter was also shown. This comprises a simple oscillatory circuit, adjustable by means of a variable condenser, so that it may resonate to wave-lengths within a wide range. Resonance is indicated by a crystal detector and a double-head telephone. A table in the lid connects condenser reading with wave-length. A selective receiver, consisting of a complete set of three inductively connected circuits, each of which is adjustable, combined in one instrument with a sensitive oscillation valve detector and its potential regulating resistance attracted no little notice. Among detectors, the oscillation valve takes first place for combined sensitiveness, reliability and robustness. The multiple tuner may be described as an instrument used in the receiving circuit which, by means of three adjustable inductively connected circuits, applies the principles of resonance and coupling to strengthen the incoming electro-magnetic impulses of one desired wave-length, and to weaken the impulses of all other wave-lengths. It has a wide range, from 100 to 2,500 meters. The "Std. bi" arrangement of the instrument—which is obtained by a change-over switch—connects the aerial circuit direct to the detector circuit. It is then ready to respond to impulses of all wave-lengths. It is preferably used with the magnetic detector.

This well-known detector for electro-magnetic waves requires no adjustment, it is unaffected by moisture and temperature, and is proof against mechanical shocks which would render more sensitive detectors useless. The instructional buzzer shown has been devised for the purpose of training operators to read Morse by ear at the usual commercial speed, but at weak intensity of signals. The transmitting circuit consists of a dry cell, operating key, a silent buzzer, and induction coil. The receiving circuit consists of an inductive coil and a pair of head telephones. The coupling of the two coils can be adjusted from a maximum to nothing, and the strength of the telephone current varied accordingly.



Magnetic Detector.

Finally, mention should be made of the model of wooden and steel lattice masts which have now given place to hydraulic pressed-steel tubular masts. The model shown corresponded in every detail with the standard Marconi land station mast, reduced to one-sixth full size. The design permits of masts of any size being constructed with standard sections.

THE MARCONIGRAPH

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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.

CONTENTS

The Share Market

The market in Marconi issues since our last issue has been a very active one, and has broadened out considerably, buyers coming forward from all parts of the globe.

The developments of Marconi wireless in Canada have brought the Canadian company's shares into favour, and many people who have made big profits out of the Marconi shares are now turning their attention to the Canadian issue.

Prices since our last issue of November 24th have risen considerably. On December 20th the following were the prices:

Marconi Ord. to 58s. 3d., after having been 59s.
Do. Pref., 2¼.
Do. New Shares, 18s. premium.
Canadian Marconi, 17s. 3d.

The market was looking very firm.

The International Bureau

A circular has been issued by the Bureau International de l'Union Télégraphique (Convention Radio-télégraphique Internationale) at Berne, intimating that the Dutch Government have applied through their Minister for a representative on behalf of the Dutch East Indies, and another on behalf of Curaçao, at the next Conference on Radio-Telegraphy, which meets in London in June, 1912.

Arrests by Wireless

A curious situation has arisen in German shipping circles over the demand of the Foreign Office to the effect that the steamship lines should instruct their captains to arrest on the high seas persons for whose apprehension a warrant has been issued, the notice to do so being received by wireless. All the companies, with one exception, have decided to comply with the request, but the company not complying, strengthened by the opinion of a well-known authority on international law, takes the view that a shipmaster is not an official of the Public Prosecutor's department, and has no power to detain a passenger, unless it be for an offence committed on board. It, therefore, refuses to instruct its captains in the manner indicated. No such procedure has so far been contemplated in this country. Shipmasters are always prepared to assist the authorities; and in the case of Crippen, it may be remembered, the actual arrest was made on board a steamer.

Imperial Wireless Telegraphy

Speaking at the fourteenth annual meeting of the British Empire League, Mr. Herbert Samuel (the Postmaster-General) referred to the question of communications as one of the greatest problems of the Empire, and said that it had been the invention of the electric telegraph which had done more than anything else to promote the growth of the Imperial unity which we had seen during our time. He said the Government were pressing forward a system of wireless telegraphy stations which would enable communication to be carried on between the United Kingdom, the Mediterranean, Africa, India, Australia and New Zealand. By that means they hoped to facilitate and cheapen communication along that Empire route.

News of the sudden eruption of Stromboli Volcano was first known at Catania Observatory as the result of a wireless message.

The Patent Situation

PROCEEDINGS at law have been commenced in New Zealand by Marconi's Wireless Telegraph Co. Ltd., against Huddart Parker, Ltd., for infringement of the Company's patents by the use of the Telefunken system of wireless telegraphy on board some of their ships plying between Australia and New Zealand. Instructions have been cabled to commence similar proceedings in Australia against the same firm and the Australasian Wireless Co., who supplied the plant.

The Helsby Wireless Telegraph Co., Ltd., having applied for a licence to work under the extended patent granted to Sir Oliver Lodge, and now the property of the Marconi Co., the Board of Trade appointed Sir Cornelius Dalton, late Comptroller-General of Patents, as arbitrator. The hearing commenced on December 11th and is still proceeding.

Messrs. Siemens Brothers & Co., Ltd., the assignees in this country of the Telefunken system of wireless telegraphy, have also applied for a licence to work under this patent, and are assisting the Helsby Co. in the arbitration proceedings. It is contended on behalf of the applicants that they cannot work any system of wireless telegraphy without a licenec under the patent in question. The arbitrator has fixed tentatively January 22nd, if convenient to all parties, for the hearing to be resumed.

The Helsby Wireless Telegraph Co., Ltd., have installed the system on four of the ships of the London & North Western Railway Co., and the original application was for a licence for these four ships, but upon the submission of the blue prints of the actual installations, the Marconi Co. contended that their No. 7777 patent was infringed; the arbitrator is therefore asked to define the terms of a general licence, excluding these four ships, in respect of which other proceedings will be commenced.

The Marconi Co. are determined to protect their rights under their patents in all countries, and legal proceedings are pending in respect thereof in France, Spain, and the United States of America.

Great pains seem to have been taken to publish on the Continent, and in the Colonies, the fact that Marconi's Wireless Telegraph Co. have withdrawn an action commenced against Messrs. Siemens Brothers & Co. in respect of the Telefunken patents. Our readers will be interested to know what are the facts of the case.

On October 20th last the Marconi Co. issued a writ against Messrs. Siemens Brothers & Co. for infringement of their Patent No. 7777. On the following day it was determined to sue Messrs. Siemens in respect of infringement of another patent, and therefore a new writ was applied for, embracing both the four sevens patent and the other one. It being obviously useless to proceed with two actions for infringement of the same patent, the writ No. 1 was withdrawn, but the action for the infringement of the patent with which it dealt is continuing under the writ issued on October 21st.

The communication of such information to the Government of the Commonwealth of Australia was immediately followed by a report that the Commonwealth Government has discontinued the contract which it entered into for the erection of stations under the Telefunken system.

A Suggestion from Penarth

The following is the text of a letter which appeared in the *South Wales Daily News* on December 20th, from Mr. Richard Richards, of Broomfield Place, Penarth :

> " I am very pleased that the gallantry of the French sailors is to be recognised, and I hope the Marconi operator who intercepted the message from the stranded ' Delhi ' will not be forgotten. As one who some years ago watched the poles at the end of the beautiful cliff walk at Penarth with thoughts of some terrible engine of destruction being laid down, I think it is time that we do something to honour Marconi by placing a monument of some description there. The spot is singularly appropriate, overlooking the channel, where thousands of sailors of all nations—to whom it would also serve as a beacon—pass from the great ports of Cardiff, Newport, Bristol, etc. With the rescues all over the world so fresh in our memories, we should give honour to whom honour is due, lest we forget."

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 January of preceding years.]

1899.

January 8th.—Mishap to East Goodwin Lightship reported to Trinity House by wireless telegraphy.

1901.

January 8th.—Wireless telegraphy experiments on "Princesse Clementine" carried out during storm, communication being maintained all the way from Ostend to Dover.

1902.

January 22nd.—Mr. Marconi sailed for America on s.s. "Philadelphia," and during the voyage he succeeded in receiving legible messages up to 1,551½ miles, and Morse signals up to 2,099 miles from Poldhu station.

1903.

January 19th.—Messages from President Roosevelt to King Edward were sent by wireless telegraphy from Cape Cod station through Poldhu station.

January 22nd.—The s.s. "St. Louis," which was not then fitted with wireless telegraphy, broke down. Passengers' committee, which was formed, expressed regret of absence of wireless, and shortly afterwards Marconi apparatus was installed on this vessel.

1905.

January 1st.—Messages for ships at sea were accepted at post offices throughout the United Kingdom.

January 17th.—Agreements entered into for the equipment of a number of the largest trans-Atlantic liners.

1908.

January 23rd.—Agreement made for supply of two portable military sets to the Siamese Government.

1909.

January 23rd.—The great services of wireless telegraphy to shipping demonstrated by a mishap to a great liner in mid-ocean. Communication between the vessel and the Marconi station at Siasconsett, and other vessels equipped with Marconi apparatus, which went to the assistance of the injured ship, with the result that the whole of the crew and passengers were saved.

1910.

January 25th.—Mr. Godfrey C. Isaacs appointed managing director of Marconi's Wireless Telegraph Co.

January 26th.—Orders received for the equipment of nine vessels belonging to the Allan Line.

Lectures

A lecture was given by Mr. G. Murfitt at St. Mark's College, Chelsea, S.W., on the commercial side of wireless telegraphy, on Saturday, November 25th, 1911. At the close of the meeting a hearty vote of thanks was passed to the Marconi Company for the loan of lantern slides, which were used to illustrate the lecture.

Mr. John McLaren delivered a lecture on "Wireless Telegraphy" before the Institute of Marine Engineers, London, on December 11th. He maintained that a study of this subject must claim the close attention of the marine engineer, as wireless telegraphy was now regarded as an essential part of the outfit of large passenger vessels trading to all parts of the world. Mr. McLaren drew attention to the advantages of using wireless telegraphy on board ship, and described the various types of Marconi apparatus now available.

Capt. H. Riall Sankey, a director of Marconi's Wireless Telegraph Co., Ltd., lectured before a crowded audience at the Beth Hamedrash and Jewish Institute on December 2nd on the subject of wireless telegraphy. Keen interest was displayed in the simple yet lucid explanation of the principles of wireless telegraphy, and in the clearly narrated history of its technical and commercial development. The lecture was illustrated by means of lantern slides, and some specimens of Marconi apparatus were exhibited. In proposing a vote of thanks to Capt. Sankey and to the directors of the Marconi Company, the chairman, the Rev. Dr. Feldman, dwelt upon the great services which Mr. Marconi's far-reaching discoveries had rendered to humanity in minimising the terrors of the ocean.

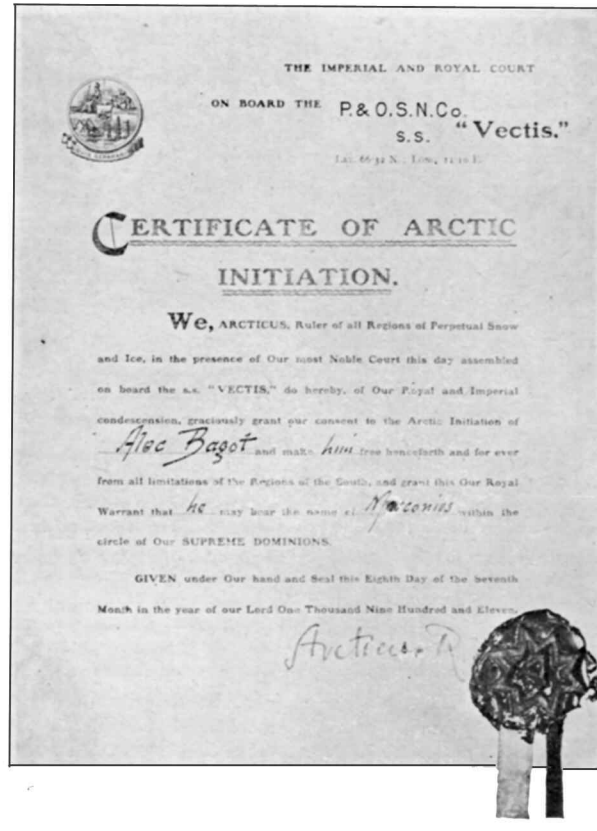
Powerful Swedish Station

Sven Hedin, Svante Arrhenius, and several well-known business men have petitioned the Swedish Government for a concession to build a wireless telegraph station, on the Marconi system, near Stockholm, with a power radius of 1,200 miles, which will permit a regular telegraphic connection between Sweden and several European and other countries, Canada, the United States, South America, Africa, Asia, Australasia, and with ships on the high seas. The connection with Great Britain would be direct, and with most other countries via Great Britain. A company will be formed with a share capital of £100,000. The station will be ready in a year.

In Arctic Regions.

THE penetration of the Arctic circle by wireless telegraphy should make it possible for that ambiguous personality, "the man in the street," to realise the tremendous grip which Mr. Marconi's invention has effected upon the world at large. Reference was made in a recent number of this journal to the voyage of a United States revenue cutter, fitted with Marconi apparatus, to the Antarctic circle, from whose frontier communication was maintained with the mainland without any difficulty. The complete story of this great accomplishment will be told on some future occasion. In the meantime an interesting incident deserves to be recorded.

The P. and O. steam yacht "Vectis," fitted with Marconi wireless telegraphy, was inside the Arctic circle from Saturday, July 8th, 1911, until the following Wednesday. At 10 p.m. on the Sunday, when about eighty-six miles from her destination, Spitzbergen, the "Vectis" encountered a floating ice pack. After skirting this ice in a vain endeavour to find a passage through, the yacht was turned south and proceeded to Cape North. While crossing the circle, "Arcticus, King of the Regions of Ice," boarded the vessel and initiated the officers and passengers as subjects of his kingdom. The ceremony was very similar to that performed when "crossing the line," and caused much amusement. Each person thus initiated was awarded a certificate of freedom "from all limitations of the south." The wireless operator on board the yacht, Mr. A. Bagot, was thus initiated and received a certificate, of which we present an illustration on this page. Mr. Bagot is curious to know whether the "Vectis" was in the magic circle before the "Bean," and, if so, whether it may be credited with priority.



THE IMPERIAL AND ROYAL COURT

ON BOARD THE P.& O.S.N.Co. s.s. "Vectis."

CERTIFICATE OF ARCTIC INITIATION.

We, ARCTICUS, Ruler of all Regions of Perpetual Snow and Ice, in the presence of Our most Noble Court this day assembled on board the s.s. "VECTIS," do hereby, of Our Royal and Imperial condescension, graciously grant our consent to the Arctic Initiation of Alec Bagot and make him free henceforth and for ever from all limitations of the Regions of the South, and grant this Our Royal Warrant that he may bear the name of Marconis within the circle of Our SUPREME DOMINIONS.

GIVEN under Our hand and Seal this Eighth Day of the seventh Month in the year of our Lord One Thousand Nine Hundred and Eleven.

Arcticus Rex

From Siasconset Log Book.

NEARLY every week during the winter season the Marconi wireless station at Siasconset, U.S.A., reports to the Revenue Cutter wrecks of schooners. The number of messages of this kind handled at Siasconset would surprise the uninitiated. The following extract from the official log for November 17th gives some idea of the reports of wrecks of schooners received at Siasconset:

"8.30 a.m. RCU (Revenue Cutter 'Acushnet'), says going to Vineyard with schooner.

"Coskata reports crew of vessel on Great Point all lashed to rigging with seas breaking clear over them. Wants cutter's assistance, as they cannot get through the surf to them. Advise 'Acushnet.'

"9.1 a.m.—RCU says: 'We are towing schooner to nearest place of safety, and will return immediately to Great Point.'

"9.26 a.m.—DKS nil.

"9.47 a.m.—RCU nil. Tell RCU another schooner requires assistance at Pollock Rip.

"Coskata reports lifesavers have now reached schooner 'Charles Walston,' and are taking crew off."

The wireless telegraph mast at Westward Ho! for communicating with Lundy Island, which was blown down through the recent storm, has again been set up.

Reviews of Books

"WIRES AND WIRELESS," by T. W. Corbin. (C. Arthur Pearson, Ltd., 17–18 Henrietta Street, London, W.C., 1s. net.)

As might be gathered from the title, this book is not devoted exclusively to wireless, but deals in a general way with the use of electric currents in telegraphy and telephony. It is neither a text-book for students nor a treatise for the scientist or practical man; the book simply presents a readable description of the various ways in which electricity is made to carry messages and the general principles of the appliances used. The first chapter deals appropriately with the "unseen messenger" that has made long-distance communications and signals possible, and after an explanation of the elementary principles of electricity the author, in succeeding chapters, tells us as much as is possible in the limited space at his disposal about telegraphs. The tenth chapter is devoted to wireless telegraphy. Only ten pages are given to an explanation of the principle upon which the system works, and anything in the nature of a detailed description of the apparatus used has been avoided. We have no fault to find with the account which the author has given of wireless, which, like the other sections of his book, will be found interesting and, indeed, instructive. We venture to predict, however, that the chief effect of the chapter on wireless will be to whet the reader's appetite and send him in quest of further information. The author claims that wireless is the oldest form of telegraphy, and in support of his assertion he takes us back to the days of the Spanish Armada, when "the red glare of Skiddaw roused the burghers of Carlisle." He considers that this was a species of wireless telegraphy which was in all essentials identical with the wireless telegraphy of to-day. It is possible to go even much farther back than this, however, to discover analogies.

It remains to be said that the illustrations and diagrams in the book, to the number of thirty-eight, are both helpful and interesting. The frontispiece shows a Marconi operator in his cabin on board ship listening to the sounds which spell out to him the messages which the ether waves are bringing from the distant shore or ship. Other illustrations are those of the long-distance Marconi station at Poldhu and the Marconi cabin on the s.s. "Minnetonka." Obviously the picture on the outside front cover has been inspired by the familiar picture which adorns the front cover of THE MARCONIGRAPH.

"THE 'MECHANICAL WORLD' ELECTRICAL POCKET BOOK." (Emmett & Co., Ltd., Manchester and London, 6d.)

The 1912 issue of "The *Mechanical World* Electrical Pocket Book" has been enlarged by the addition of sixteen pages, while considerable improvements have been effected in various sections of this popular handbook. Attention is directed to the fact that the matter devoted to lighting has been entirely rewritten and is now presented in two sections, one dealing with electric lamps and the other with electric lighting. A new section on motor starters has been introduced, also one on static transformers, and another on the construction, rating, and testing of high-tension apparatus. The new tables relate to aluminium cables, power factors, maximum currents for copper conductors, etc. The book in general has been thoroughly revised and many new illustrations introduced.

The book is one which can be recommended to telegraphists who are in charge of electrical plant or apparatus. It does not take up much room in the pocket, and has the further advantage of space for diary and memoranda.

"LA TÉLÉGRAPHIE SANS FIL APPLIQUÉ À LA MÉTÉOROLOGIE, AUX PRÉVISIONS DU TEMPS ET À L'ETUDE DE LA PHYSIQUE DU GLOBE," by A. Boutquin. (Brussels, Société Belge d'Astronomie.)

The importance of wireless telegraphy to meteorology is scarcely realised by the general public, if not by the very parties who benefit so considerably from the greater accuracy with which the combination has endowed weather forecasts. In a recent issue of THE MARCONIGRAPH we traced a development of the application of wireless telegraphy to meteorology, and showed how great was the benefit which the old science derived from the new. Dr. W. N. Shaw, the distinguished director of the Meteorological Department in London, and Dr. Polis, of Aix-la-Chapelle, have proved the advantage of being able to obtain by wireless particulars of important zones which they would otherwise be unable to make use of in their observations. M. Boutquin has also given considerable attention to this matter, and has produced an interesting brochure under the above title. M. Boutquin lays great stress upon the fact that wireless telegraphy now furnishes a means of calculating the value of the various influences that affect the science of meteorology. His brochure can be read with much interest and profit, whilst he is at the same time to be congratulated upon having collected such convincing evidence in support of a very great movement.

Reed Tuning

BEING inundated with inquiries from members of the Stock Exchange and the public as to the Company's knowledge and information upon what is termed "Reed Tuning," Mr. Godfrey C. Isaacs, the Managing Director of Marconi's Wireless Telegraph Co., Ltd., found it necessary to make a public explanation of the position, in which the following statement occurred :

"The fundamental principle of all reed tuning is a receiver in which a mechanically vibrating part is tuned to the frequency of received electrical impulses. There is nothing new in this principle, for which we hold the master patents. Some years ago we gave the subject very careful and exhaustive study and consideration."

In a further communication on the subject, Mr. Isaacs adhered to the foregoing general statement which he declared he would maintain should occasion arise.

Some days ago a demonstration of the systems propounded by Messrs. A. T. M. Johnson and F. H. Varley for "cheap cable messages and secret wireless telegrams," was given at 37A Finsbury Square, London, E.C. The apparatus was arranged round the sides of a small room, and consisted mainly of instruments used to demonstrate the principles employed by the inventors, being of a more or less experimental character. The following is the account of the demonstration given in the *Electrical Review* :

"The idea at the base of both systems is that of syntony obtained by means of tuned reeds ; each letter or numeral is represented by a sending and a receiving reed of identical pitch, and it is claimed that the tuning is so sharp and the system is so free from interference between signals of only slightly different pitches, that forty-nine differently tuned signals can be obtained within the range of one semitone. Obviously, in theory at least, each letter or other signal could be transmitted by depressing a given key on a suitable keyboard, which would actuate the corresponding sending reed, and the signal would be picked up at the receiving station by a similar reed connected to a recording device. Thus a message could be transmitted as fast as it could be written on a typewriter.

"But while this is very pretty and plausible, it fails to take due account of practical conditions. And this is, perhaps, not surprising in view of the fact that the chief inventor appears to be Mr. Johnson, who was formerly a Professor of Music in Victoria, and therefore could hardly be expected to be fully conversant with the working of submarine cables. That Mr. F. H. Varley, who is associated with Mr. Johnson in the matter, did not enlighten his colleague is less easily explained.

"The demonstration consisted for the most part of elementary explanations of the behaviour of tuned and untuned reeds, with which our readers need not be troubled. Unfortunately, even on a subject so closely related to his own profession, Mr. Johnson's views are unreliable, for one of the essential features of the system is that the rate of vibration of reeds is uninfluenced by variation of temperature. He essayed to explain the statement by pointing out that change of temperature would cause change of all the dimensions of the reed in the same proportion, and claimed to prove it by an experiment with a pair of tuned reeds and a saucepan of hot water, which carried conviction to no engineer's mind. But the professor appeared to be unaware that the frequency of vibration of a reed varies as the thickness, and inversely as the square of the length, so that proportionate variation of dimensions with temperature *must* cause change of pitch, while the decrease of elasticity with increase of temperature aggravates the error.

"The wireless part of the affair was more directly in Mr. Varley's hands. While utilising the same principle, it is claimed to be an untappable system. A stream of waves is emitted under the control of a reed slightly out of tune with the receiving reed, which is therefore unaffected ; the signals are transmitted by the aid of a key which modifies the sending reed, so as to bring it precisely into tune with the receiver, which is, therefore, affected when the key is depressed. It is claimed that an outsider would not be able to distinguish the very slight change of pitch which marked the sending of each signal. We doubt this, under practical conditions. But even if it be true, the fact that a station thus sending out a continuous train of waves seriously interferes with all other stations within range is a very grave objection. That it does so we know from the mouth of Mr. Johnson, who informed our representative that a certain English coast station was, to use his own expression, 'paralysed' and unable to receive any signals while the Johnson-Varley apparatus was at work.

"We have said enough to show that, in our opinion, the inventors are dealing with matters with which they are not at all conversant, and we fear there is a painful disillusionment awaiting them. Fortunately, as one of the promoters informed the audience, they 'are not out for money,' as they claim to have a financial backing. Appearances belied the statement ; but at all events, they are unlikely to obtain support in electrical circles."

Journalism's Debt to Mr. Marconi

CONTRIBUTIONS amounting to £1,218 were announced at the festival dinner of the Newsvendors' Benevolent and Provident Institution, held during the past month at De Keyser's Royal Hotel, London. In the regrettable asbence of Mr. G. Marconi, the chair was taken by the president, the Hon. Harry Lawson, M.P.

In proposing the toast of the evening, the chairman observed that they had all been looking forward to welcoming Mr. Marconi. He was one of the greatest living benefactors of mankind. He had annihilated distance, relieved anxiety, and added happiness to all the people upon the earth. It was not a small thing that he should enable them to converse, no matter what distance separated them. Those interested in newspapers owed him a debt of gratitude, because they believed that through his agency they would be able, not only directly, but indirectly, to increase the amount of news that they gave to the public, and to get it at a more reasonable cost. Personally he should have been glad to welcome him as a distinguished Italian. Whatever might be the circumstances of the hour, they did not forget that they had no firmer friends on the Continent of Europe than the Italian nation. They admired the Italians for their unquenchable patriotism and for undaunted enthusiasm. Speaking of the institution, he remarked that Mr. Marconi, in his plea on behalf of the institution, said if the committee were to keep pace with the sad appeals they must have more funds at their disposal. At present, continued the chairman, there were eighteen persons in great distress who were candidates for election to permanent pension benefit—thirteen newsmen and five newswomen.

Mr. Bram Stoker, in responding to the toast "Literature and the Press," said that no man in war, in exploration, in science, or any other form of human endeavour could succeed without imagination. For that reason and no other he said that imagination was the basis of literature. Let them take, for example, the great work done by Mr. Marconi. A long time ago Isaac Newton reasoned out that something more than the atmosphere in which we lived was necessary to produce the effects which were provable by science, and he dreamed a great dream, that there was something in the universe which had not yet had a name. It fructified, and in due season Kelvin's hypothesis taught us the beginning of astral worlds. Then came Mr. Marconi, who carried into practical use the discoveries made by himself and even before his time.

Wit by Wireless

Mr. Walter Emanuel, the famous humorist, whose witticisms adorn a well-known page of *Punch* each week, and who has enlivened many a public banquet by reading imaginary telegrams from celebrities unable to attend, has now "adopted" wireless telegraphy for the latter occasions, as a result that these telegrams have increased in quantity. At a dinner of the Authors' Club, on December 18th, he read the usual series of wireless telegrams, of which the following specimens are representative :

The Kaiser : Sorry ! I don't mind your plum-pudding, but I cannot stand your "mean-spies."

Mr. Lloyd George : Do you expect Bobbie Cecil ? Anyhow, I don't think I will come. You know my hobby. I might even tax your patience.

The Mayor of Calcutta : Sorry cannot afford to come, owing to sudden loss of capital.

An invitation sent to the new Censor of Plays, and addressed to "Dear Old Charlie, care of the Lord Chamberlain," has been returned marked "Unknown."

On Inventors

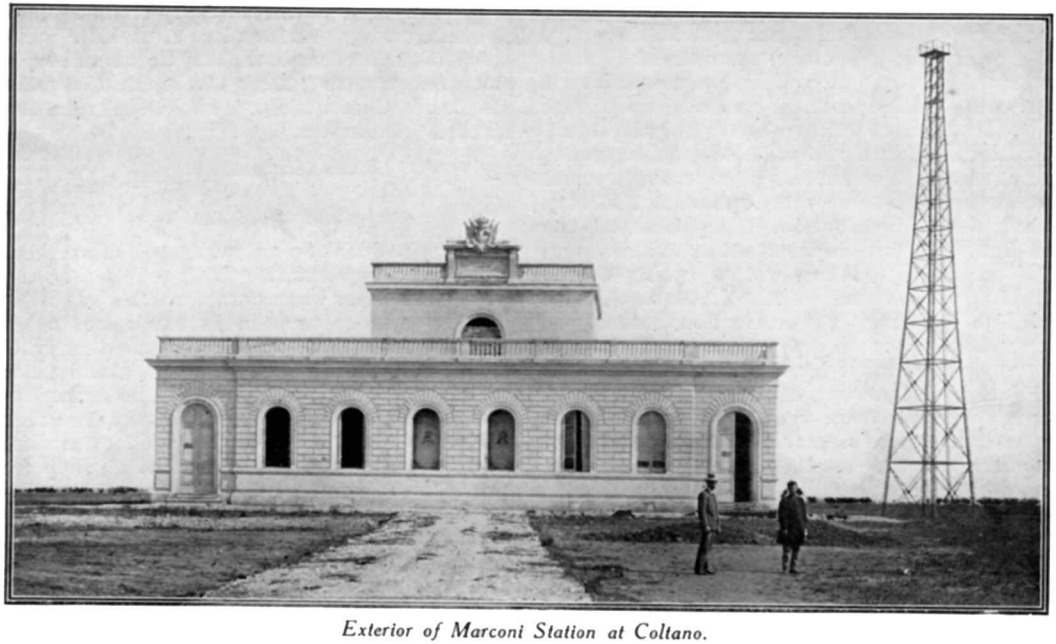
Near the door of a patent agent's office there appeared a typed notice to the effect that the average inventor was a crank, whose ideas of his own importance were in inverse ratio to his capacity for business. This seems rather cruel on the man who is looking for financial assistance to develop what he believes to be a money-making invention, but it is probably true that not one in ten of the ideas for which patents are granted are worth the paper on which they are printed. The curious thing is that with multitudes of ingenious minds at work so many problems in mechanics should remain unsolved. There are the innumerable inventions that nobody needs—a case in point being an electric machine for enabling legislators to record their votes without leaving their seats. When, with pardonable pride, the inventor explained this apparatus to the authorities at Washington, they rebuffed him by telling him that it was the last thing in the world which the House of Representatives wanted.

Messrs. A. W. Gamage, Ltd., of Holborn, London, are exhibiting and working amateur sets of wireless telegraphy made under licence from the Marconi Company. Needless to say, it is difficult to get anywhere near the operator while the sets are working.

The Marconi Station at Coltano.

A Triumph of Genius.

THE progress of wireless telegraphy has just been marked by the installation of a station at Coltano, in Italy, which is capable of transmitting and receiving messages to and from 10,000 miles or more. It is the most powerful station yet constructed, and the calculation of its range is based upon the fact that the Transatlantic station at Clifden, in Ireland, which has a considerably lower power, recently succeeded in communicating a message to Buenos Ayres, 7,000 miles distant. The importance of the development is emphasised by the opening of the high-power stations at Cadiz, Barcelona, Teneriffe, and Las Palmas, at which both internal Spanish telegrams and external telegrams will be worked, and that these stations will immediately open services with Italy and with England and other countries. Thus the gradual co-ordination and world-wide efficiency of wireless telegraphy is approaching completion. The map on p. 9 shows the position of that station and its relation to other stations.



Exterior of Marconi Station at Coltano.

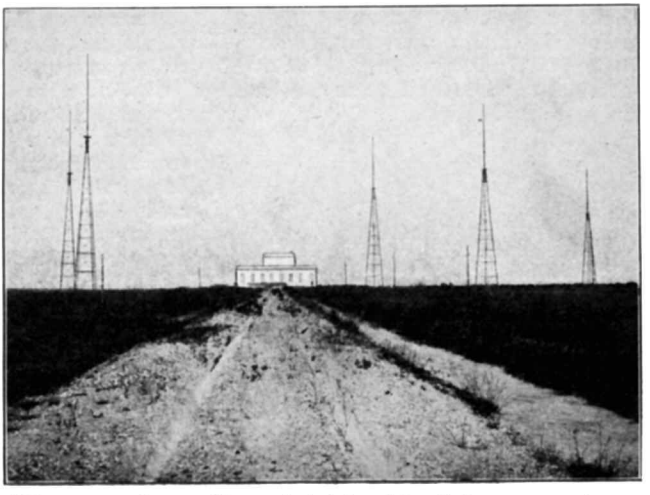
The Coltano station was inaugurated under the personal direction of Mr. Marconi. Its available power is 1,000 kilowatts, as compared with Clifden's 500 kilowatts, and it is expected that the projected South American stations will be in communication with it.

An interesting incident prior to the opening of the Coltano station is reported. Mr. Marconi desired to communicate with the Marconi stations at Clifden, in Ireland, and Glace Bay, in Canada, and accordingly sent telegrams by ordinary wires and by cable to those stations requesting them to tune up and be prepared to communicate with Coltano at a given hour. Later in the day, however, a telegram was received by Mr. Marconi informing him that his telegram had been received but was unintelligible owing to the storm. Whereupon Mr. Marconi decided to call both Clifden and Glace Bay by wireless, and at four o'clock sent a message from Coltano to Clifden, and received the immediate reply: "Your signals are strong and readable." With Glace Bay

(Canada) equally satisfactory communication was at once established. In reply to the telegram sent by Mr. Marconi to the Italian Minister of Posts and Telegraphs advising him of the successful opening of the station, he received the following telegram :

" I thank you for your kind telegram, which I will make a point of communicating to-day to my colleagues of the Cabinet. The intimation that Coltano is now able to transmit to and receive from your English and Canadian stations will be much appreciated by my colleagues, as well as by the whole country. The transoceanic radiotelegraphic communication by means of the new high-power station will add to the triumph of your genius, and is a new instrument of civilisation and glory to the country."

The idea of building a great wireless station at Coltano suggested itself to Mr. Marconi on board the s.s. "Carlo Alberto," of the Italian Navy, where he was at the time carrying on interesting experiments. Mr. Marconi was greatly encouraged in his idea by Admiral Mirabello, who was in charge of the vessel, and who was impressed by the fact that off the south of Cagliari the vessel could transmit messages across Europe, the Alps, and part of the Mediterranean Sea from Poldhu with great ease. The Italian Government approved and accepted the proposal, and the Hon. Galimberti put the proposal before the Italian Parliament.



Distant View of the Aerials at Coltano.

The station has now been handed over to the naval authorities, and upon hearing of its successful completion and working the Minister sent the following message to Mr. Marconi :

" I send you most hearty congratulations on the completion of the high-power station at Coltano, which adds new glory to your name and permits Italy to stand at the head in the new field opened by your great invention. Greetings.

" LEONARDI CATTOLICA."

Mr. Marconi replied as follows :

" Your Excellency has so kindly wished to congratulate me for the results obtained at the Coltano station, but on my part I wish to express my pride and pleasure in having to note the skill and high efficiency of the men of the Royal Navy, who are so ready to help in each branch which represents a new conquest of science and of strength."

As soon as the Marconi Wireless Telegraph Company of London were advised that the Coltano station was opened the managing director, Mr. G. C. Isaacs, sent the first marconigram via Clifden and Coltano to Queen Margherita conveying congratulations upon her birthday, and received in a very short time by the same route Her Majesty's acknowledgment and thanks. On December 11th the Marconi stations of Massowah and Mogadiscio on the East Coast of Africa were opened, and these towns will now be in direct communication with Italy by wireless telegraphy.

Mr. Marconi has received a warm telegram of congratulation from the King of Italy.

✦

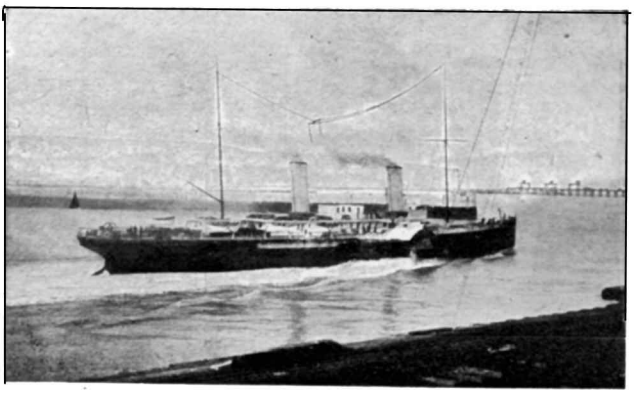
Messrs. Macnaughtan Brothers, of 190 West George Street, Glasgow, have been appointed sole agents in Scotland by the Marconi International Communication Co., Ltd., of London.

✦

The appeal for funds to equip the expedition which Mr. Douglas Mawson is leading into the Antarctic has met with so generous a response, that for the first time in the history of Polar exploration the explorers will be able to keep in constant touch with the outside world by wireless telegraphy. With the aid of the Marconi Company, Mr. Mawson proposes to set up a station in the Antarctic, and to establish easy communication with some station in Australasia.

Maritime Wireless Telegraphy

THE past month has been one of the most trying for the cross-channel steamers, but they have survived the ordeal splendidly, and without mishap. This is not surprising to the countless thousands who have crossed and recrossed the Channel, say, in the modern and well-equipped vessels owned by the Belgian State Railways and Royal Mail Service. These vessels run between Dover and Ostend, and not the least important feature of them are the wireless telegraph services, which are a boon to anxious friends or business men concerned about a vessel's delay in an extremely rough crossing. We hope at a later date to describe the cross-channel services and their wireless equipments more fully; meanwhile



Dover-Ostend Steamer.

the management of the Belgian Royal Mail steamers deserve to be highly congratulated upon having carried out an uninterrupted service, and to have even added special holiday services during the rough weather of December.

✦

Wireless brought help to two distressed coasters which were being battered on Nantucket Shoals (U.S.A.), the revenue cutter "Gresham" (called by the Charlestown Navy Yard), speeding down from Gloucester to send a helping line to the two-masted schooner "Henry May," bound from New York for an Eastern port, while the cutter "Acushnet" (called by the wireless station at Newport) steamed down Nantucket Sound from Woods Hole and hauled the schooner "William Mason," bound from Long Cove, Me., for New York, to anchorage off Hyannis. This is the second time the "Acushnet" and "Gresham" have been hastily summoned by the wireless to give aid on the Nantucket Shoals.

✦

The "Prinz Joachim," which ran aground off the Bahamas recently, might have been in a sad plight but for the services of wireless. The first wireless message received in New York came from the coastwise steamer "Panama," off Cuba, and said: "Wireless operator on 'Prinz Joachim' is sending C.Q.D. signal. Is aground on Samana Island." A few minutes later the following marconigram, twice relayed by Atlantic coast liners, was caught at Fire Island and flashed on to New York. It was from the wreck, and signed Fey, the "Prinz Joachim's" captain: "Struck the rocks off Samana at 3.50. At work on cargo. Taking in water. All ready abandon ship. Six o'clock coffee served. Passengers all calm. Vessel resting easily. No danger, but cable help." Samana Island is one of an uninhabited series of rocks in the Bahama group, 200 miles north-west of Haiti, 30 miles east of Fortune Island, and 150 miles south-east of Salvador Island, where Columbus landed. Mr. W. J. Bryan was one of the distinguished passengers on board, and he sent the following wireless message to his brother in Lincoln, Nebraska: "Aground a mile from shore. Don't worry."

✦

The following vessels were fitted with Marconi 1½-kw. and emergency plants during the month ended December 18th: "Circassia," "Castalia," and "Columbia," for the Anchor Line; "Maunganui," the Union Steam Ship Co. of New Zealand; "Montoro," Messrs. Burns, Philip & Co.; "Nigeria," the Elder Dempster Line; "Arcadian," the Royal Mail Steam Packet Co. The vessels in course of equipment at the date mentioned include: "Akabo," the Elder Dempster Line; "Caledonia" and "California," the Anchor Line; and "Princess Patricia," the Canadian Pacific Railway Co.

✦

Instructions have been received to equip the

following vessels : " Ekma " and Nos. 497–8, the British India Steam Navigation Co. ; " Huallaga," Compañia Peruana de Vapores y Dique del Callao ; " Irishman," the White Star Line ; " Bruce," Reid & Co., Newfoundland ; " Adventure," " Bellaventure," " Bonaventure," and " Newfoundland," Harvey & Co., Newfoundland ; " Amber," the Eastern Telegraph Co. ; and " Ramos," the Amazon Cable Co.

The Marconi Company have contracted with Messrs. Vickers for the equipment of the Chinese school-ship cruiser just completed at Barrow. The installation will consist of a 3-kw. motor generator set, producing, by means of the Marconi disc discharger, a musical note of 700 frequency. In addition to the magnetic detector, the receiving apparatus will include a valve-tuner set. Space is to be found in the ship for the installation of six sets of practice apparatus to be used in the instruction of the Chinese cadets. The transmitting range of the apparatus will be 250 miles by day, and from two to three times that figure at night under favourable conditions, and the receiving range will, no doubt, be considerable, thanks to the provision of the valve tuner.

Another Marconi Triumph

THE new stations in Spain (described on page 9 of this issue), and particularly the Cadiz station, have recently been put to a severe test by the unfortunate wreck of the P. and O. steamer " Delhi," and they have come through the ordeal magnificently, constituting a new triumph for Marconi. Shortly after midnight on the morning of December 13th the " Delhi," conveying the Princess Royal, the Duke of Fife, and their daughters Princesses Alexandra and Maud, to Egypt, went ashore two miles south of Cape Spartel. Cape Spartel stands to the west of Ceuta and nearly opposite Gibraltar on the north-western extremity of Africa. It rises to a height of over 1,000 feet above the sea level, sloping gradually to the water.

The Cadiz station began receiving marconigrams from the " Delhi " about two o'clock in the morning, the message indicating that the vessel was in a dangerous position, and probably ashore. Demands were made for urgent help in order to avoid the imminent danger of a catastrophe. The message gave the position of the " Delhi " as two miles south of Cape Spartel, with a heavy sea running. The Cadiz station immediately transmitted the message to the P. and O. Company's agents at Gibraltar, urging them to send help, at the same time communicating with any ships at sea in the vicinity which might take a message. The first answer came from the battleship " Prince of Wales," and was followed immediately by another from the " Duke of Edinburgh," which left Gibraltar at once for the scene of the disaster. Inquiries came during the whole of the following day from England by wireless, Queen Alexandra herself sending messages. The Spanish National Wireless Telegraph Co. are to be congratulated upon the successful manner in which they came through a trial of great emergency.

A naval correspondent writes to the *Standard* from Portsmouth : " The official ' explanation ' given here of the failure of the ' Delhi ' to communicate with Gibraltar is that of late flagships have been so hampered by taking in wireless messages that orders for the fleet to ' stop talking ' have been quite common. On this principle, the ignoring of any private message is easily explained."

Windmill Hill, Gibraltar, like many, if not all, other Admiralty stations, says our contemporary, is permitted to answer the distress call from commercial ships. But no answer was returned to the " Delhi." An Admiralty official, with great sangfroid, explained it. " The ' Delhi's ' apparatus would send out its messages with one or both of two wave-lengths —namely, 300 and 600," he said. " Now the Admiralty stations only receive messages, as a rule, tuned to wave-lengths varying from 600 to 1,600. Hence the chance of an Admiralty station receiving a signal of distress from a commercial vessel at any time—although the Admiralty expressly states in its regulations that such messages may be received and acted upon—is remote. That is undoubtedly what happened. While the British warships were unacquainted with the serious position of the ' Delhi ' the ' Friant,' a French cruiser, was rushing to the rescue."

Luckily, the point that emerges is that around our own coasts new Admiralty stations are continually being established. The appalling number of shipwrecks serves to emphasise not only the necessity for a wider application of wireless telegraphy, but for the establishment at every Admiralty station on our shores of receivers which can always take the signal of distress.

The Spanish Press is enthusiastic over the timely rescue effected through wireless, as the following extract from *El Diario Universal*, of Madrid, shows : " The magnificent invention of Marconi, the wonder of the age, has rendered yet another service to humanity. It is due to his invention that countless families are not mourning at the present time losses from sea tragedies. For such an admirable communication has been the result of saving hundreds of passengers who within a few hours found themselves in danger of losing their lives."

Foreign News

China.

An extraordinary development of banking, aided by modern science, has been in progress during the revolution in China. The city of Hankow has been in the thick of the fighting, yet amidst all this tumult business has been carried on and moneys in large amounts have passed between Hankow merchants via London. Telegrams have been sent by the Marconi system, and have reached Shanghai, whence they have been forwarded to London. On these messages moneys have been paid on the order of persons in Hankow to the credit of other parties of that city. Incredible as it may at first appear, this new form of banking seems to be carried on on perfectly safe principles, all the parties in London being satisfied on the point. Certainly, what with money being transferred in London by wireless telegraphy from a city in rebellion in China, and China itself proclaiming a Republic, things seem to be moving.

Egypt.

The Marconi wireless station at Port Said was opened on December 1st, 1911. The call letters of the station are MPD, and the wavelengths 300 and 600. The station is open day and night for general public service, and the coastal rate is 0.60 francs per word. For radiotelegrams to or from Egypt there is a tax of 0.75 francs per word in the case of lower Egypt, 0.90 francs per word in the case of upper Egypt, and 1.15 francs for the Soudan. This tax includes the coastal rate and the rate for transmission across land lines.

Italy.

The Italian Administration have announced that radiotelegrams sent to wireless stations on the coast of Italy for transmission to vessels are only accepted at the risk of the senders. These messages must be written in plain language.

Japan.

M. Kenjiro Komatsu has been transferred from the position of Director-General of Posts and Telegraphs to that of Vice-Minister of Communications, in place of M. Ren Nakakoji, retired. M. Jiro Tanaka has succeeded M. Komatsu.

Russia

According to the *Rossiya*, a special conference has been held in the Russian Post and Telegraph Department for the organisation of radiotelegraphic stations on the coasts of the White Sea and Kara Sea for ships navigating to the mouths of the Obi and Yenisei. The conference decided upon the establishment of stations on Vaigatch Island, on the coast of the Vaidaran Bay, and on the Ugorski Shar Strait. The work is to be carried out in the course of one year if possible, and in two at the most.

Turkey.

An Imperial decree has been issued appointing His Excellency Ibrahim Bey Soussa Minister of Posts, Telegraphs, and Telephones of the Empire, in place of His Excellency Stamboulian Effendi.

United States.

The United States Civil Service Commission, Washington, D.C., recently held an examination at various cities throughout the country to secure candidates from which to make certification to fill a vacancy in the position of electrician and wireless telegraph operator at a salary of $900 per annum, for duty in the lighthouse service in the Territory of Hawaii, and vacancies requiring similar qualifications as they may occur. Considerable difficulty has hitherto been experienced in securing suitable candidates for the position mentioned.

An operator at the Marconi station at Sagaponack, New York, recently picked up from the road near the station a live bird, badly wounded, of a species so rare and unknown in that locality that no one could name it. It was eventually identified as a bird of the Arctic regions, and its incursion so far south is regarded as a sign of very cold weather.

Science, like art, should have no national frontiers, though there are sad instances of the fracture of the rule, as when Wagner was banned in Paris and Heine in Berlin. That makes the outbreak against Madame Curie, the distinguished scientist, on the ground that she is French only by marriage and a Pole by birth, somewhat unaccountable. The Galileos, the Newtons, the Darwins, the Marconis are citizens of the world, and as all benefit from their discoveries and inventions, each should be proud to afford a domicile and an address.

Presentation at Clifden

There was a large gathering of the staff at the Railway Hotel, Clifden, on Friday, November 24th, on the occasion of a presentation of a handsome white onyx timepiece to Mr. Spencer W. Purser on his promotion to a position in the head office of the Marconi Co. in London. Mr. T. F. Gaynor, who presided, referred to the many sterling qualities of the guest of the evening, and Mr. O'Driscoll, who made the presentation, said they had been associated both officially and socially for a number of years, and he considered that Mr. Purser's departure was a matter for regret. Mr. Hosking referred to the severance which was about to take place, and dwelt on Mr. Purser's hospitality. What was Clifden's loss would, he felt sure, be London's gain. Mr. Webb desired to associate himself with what had already been said. He hoped Mr. and Mrs. Purser and family would enjoy every success and prosperity in their new sphere. Mr. Rogers also paid his tribute, referring to Mr. Purser's kindness and help during his early days in the Transatlantic service. Mr. Norris said that, although he was a new arrival at Clifden, there was no one to whom he would concede one iota of the esteem he held for Mr. Purser.

Mr. Purser, with characteristic modesty, thanked the members of the staff, and assured all that he would not forget them and their kindness on this and many other occasions.

Music followed the speeches, and songs were ably contributed by Dr. Gorham, Messrs. O'Driscoll, Gayner, Norris, and Hosking. Mr. Purser, whose mastery of the banjo is well known, effectively rendered "The Letter-Writing Coon" and his old favourite "The Phantom Bride." A vote of thanks to the hotel management for the admirable arrangements that had been made brought an enjoyable evening to a close.

Marconi Athletic Club

A whist drive was held at the Marconi Athletic Club rooms, Chelmsford, on December 16th. Miss A. Oddy won the lady's first prize, Mr. A. Hazleton the gentlemen's, and Mr. G. Watling the consolation. About forty members and friends were present, and refreshments were provided.

On December 18th a whist and billiard match with the Arc Works Club took place. The results were as follows: Whist—Arc Works, 37, Marconi's, 12; Billiards—Marconi's, 3, Arc Works, 1.

Movements of Engineers

R. N. Vyvyan, having recovered from illness, has returned to Madrid and resumed his charge of the Spanish contract.

H. Caswall has been carrying out special tests at Varna, Bulgaria, and during his absence the installation at Constantinople has been under the charge of C. James.

Mr. Entwistle, under whose supervision the Coltano station has been erected, has returned to London for a time.

F. Post is on his way home from Balik-Papan.

R. K. Rice has arrived in Ceylon, and is in charge of the erection of the new station at Colombo.

J. J. Leary, C. H. Keith, and R. H. Strickland have arrived in England from the Fiji Islands.

A. D. Kent has been transferred from the Chelmsford Test Room to Antwerp, where he is engaged in testing apparatus.

Movements of Operators

R. Sweetham has been transferred from the "Empress of Britain" to the "Suevic."

F. G. Short has been transferred from the "Guelph" to Vigo (Spain).

J. H. Golding has been transferred from the "Inkosi" to the "Arawa."

C. A. Hill has been transferred from the "John Pender" to the "Orama."

H. E. Hardy has been transferred from the "Mesaba" to the "Kildonan Castle."

C. H. Bartlett has been transferred from the "Suevic" to the "Minneapolis."

F. J. Gowlett has been transferred from the "Andorinha" to the "Ballarat."

P. A. Roberts has been transferred from the "Aragon" to the "Avon."

E. D. Bagot has been transferred from the "Vectis" to the "Olympic."

L. L. Jones has been transferred from the "China" to the "Aorangi."

A. H. Clarke, from the "Persic" to the "Aidan."

H. S. Bride, from the "Lanfranc" to the "Anselm."

W. McGhee, from the "Empress of Ireland" to the "Carmania."

A. J. Osborn, from the "Corsican" to the "Gloucestershire."

T. Knox, from the "Teutonic" to the "Corsican."

S. V. Branton, from the "Empress of Ireland" to the "Oceanic."

H. F. Coffey, from the "Huayna" to the "Durham Castle."

V. Gardiner, from the "Lake Manitoba" to the "Maunganui."

P. Doherty, from the "Celtic" to the "Laurentic."

T. J. Chapman, from the "Winifredian" to the "Derbyshire."

F. H. Baker, from the "Virginian" to the "Huayna."

T. Evans, from the "Lake Champlain" to the "Persic."

J. R. Thomson, from the "Laurentic" to the "Lanfranc."

L. Dodds, from the "Virginian" to the "Laconia."

S. Stacey, from the "Lusitania" to the "Montoro."

C. S. Gordon, from the "Oceanic" to the "Delhi."

N. M. Drysdale, from the "Volturno" to the "Macedonia."

E. J. Moore, from the "Edinburgh Castle" to the "Olympic."

R. Harding, from the "Ascania" to the "Gaika."

A. W. O'Connor, from the "Dominion" to the "Minneapolis."

B. Gale, from the "Ionian" to the "Erinpura."

F. J. Henderson, from the "Oriana" to the "Rotorna."

W. H. Haywood, from the "German" to the "Galician."

C. H. Bartlett, from the "Minneapolis" to the "Volturno."

E. J. Trail, from the Marconi School to the "Winifredian."

J. A. Pritchard, from the Marconi School to the "Empress of Britain."

W. Raw, from the Marconi School to the "Celtic."

H. J. Lightfoot, from the Marconi School to the "Laurentic."

L. B. Cleary, from the Marconi School to the "Teutonic."

C. Whitaker, from the Marconi School to the "Empress of Ireland."

C. F. Evans, from the Marconi School to the "Californian."

J. D. Cannon, from the Marconi School to the "Baltic."

Transfers of Operators in the American Co.

M. C. Tierney, from "Sea Gate" to Siasconset.

R. M. Fennell, from the "Maracus" to the "Curityba."

K. McAlpine, from the "Philadelphia" to the "Florizel."

C. J. Weaver, from the S.Y. "Noma" to the "Philadelphia."

B. P. Adams appointed to the "Maracus."

J. H. Sellars appointed to the "Grenada."

T. Chattaway resigned.

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