metallic connection as used for wire telegraphs. The earth wire may have a condenser in series with it, or it may be connected to what is really equivalent, a capacity area placed close to the surface of the ground. It is now perfectly well known that a condenser, if large enough, does not prevent the passage of high-frequency oscillations, and therefore in this case, when a so-called balancing capacity is used, the antenna is for all practical purposes connected to earth.

I am also of opinion that there is absolutely no foundation in the statement, which has recently been repeated, to the effect that an earth connection is detrimental to good tuning, provided, of course, that the earth is good.

Certainly, in consequence of its resistance, what electricians call a bad earth will damp out the oscillations, and in that way make tuning difficult; but no such effect is noticed when employing an efficient earth connection.

In conclusion, I believe that I am not any too bold when I say that wireless telegraphy is tending to revolutionise our means of communication from place to place on the earth's surface. For example, commercial messages containing a total of 812,200 words were sent and received between Clifden and Glace Bay from May 1, 1910, to the end of April, 1911; wireless telegraphy has already furnished means of communication between ships and the shore where communication was before practically impossible. The fact that a system of imperial wireless telegraphy is to be discussed by the Imperial Conference now holding its meetings in London shows the supremely important position which radio-telegraphy over long distances has assumed in the short space of one decade. Its importance from a commercial, naval, and military point of view has increased very greatly during the last few years as a consequence of the innumerable stations which have been erected or are now in course of construction on various coasts, in inland regions, and on board ships in all parts of the world. Notwithstanding this multiplicity of stations and their almost constant operation, I can say from practical experience that mutual interference between properly equipped and efficiently tuned instruments has so far been almost entirely absent. Some interference does without doubt take place between ships in consequence of the fact that the two wave-lengths adopted in accordance with the rules laid down by the International Convention are not sufficient for the proper handling of the very large amount of messages transmitted from the ever-increasing number of ships fitted with wireless telegraphy. A considerable advantage will be obtained by the utilisation of a third and longer wave to be employed exclusively for communication over long distances.

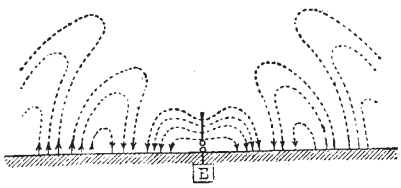

FIG. 13.

In regard to the high-power Transatlantic stations, the facility with which interference has been prevented has to some extent exceeded my expectations. At a receiving station situated at a distance of only eight miles from the powerful sender at Clifden, during a recent demonstration arranged for the Admiralty, messages could be received from Glace Bay without any interference from Clifden when this latter station was transmitting at full power on a wave-length differing only 25 per cent. from the wave radiated from Glace Bay, the ratio between the maximum recorded range of Clifden and 8 miles being in the proportion of 750 to 1.

Arrangements are being made permanently to send and receive simultaneously at these stations, which, when completed, will constitute in effect the duplexing of radio-telegraphic communication between Ireland and Canada.

The result which I have last referred to also goes to show that it would be practicable to operate at one time on slightly different wave-lengths a great number of long-distance stations situated in England and Ireland without danger of mutual interference.

The extended use of wireless telegraphy is principally dependent on the ease with which a number of stations can be efficiently worked in the vicinity of each other.

Considering that the wave-lengths at present in use range from 200 to 23,000 feet, and, moreover, that wave-group tuning and directive systems are now available, it is not difficult to foresee that this comparatively new method of communication is destined to fill a position of the greatest importance in facilitating communication throughout the world.

Apart from long-distance work, the practical value of wireless telegraphy may perhaps be divided into two parts, (1) when used for transmission over sea, (2) when used over land.

Many countries, including Italy, Canada, and Spain, have already supplemented their ordinary telegraph systems by wireless telegraphy installations, but some time must pass before this method of communication will be very largely used for inland purposes in Europe generally, owing to the efficient network of landlines already existing, which render further means of communication unnecessary; and therefore it is probable that, at any rate for the present, the main use of radio-telegraphy will be confined to extra-European countries, in some of which climatic conditions and other causes absolutely prohibit the efficient maintenance of landline telegraphy. A proof of this has been afforded by the success which has attended the working of the stations recently erected in Brazil on the Upper Amazon.

By the majority of people the most marvellous side of wireless telegraphy is perhaps considered to be its use at sea. Up to the time of its introduction, ships at any appreciable distance from land had no means of getting in touch with the shore throughout the whole duration of their voyage. But those who now make long sea journeys are no longer cut off from the rest of the world; business men can continue to correspond at reasonable rates with their offices in America or Europe; ordinary social messages can be exchanged between passengers and their friends on shore; a daily newspaper is published on board most of the principal liners giving the chief news of the day. Wireless telegraphy has on more than one occasion proved an invaluable aid to the course of justice. a well-known instance of which is the arrest which took place recently through its agency of a notorious criminal when about to land in Canada.

The chief benefit, however, of radio-telegraphy lies in the facility which it affords to ships in distress of communicating their plight to neighbouring vessels or coast stations; that it is now considered indispensable for this reason is shown by the fact that several Governments have passed a law making a wireless telegraph installation a compulsory part of the equipment of all passenger boats entering their ports.

THE PROPOSED TEACHERS' REGISTRATION COUNCIL.

IT would seem from the recently published Parliamentary Paper (Cd. 5726), entitled "Further Papers relating to the Registration of Teachers and the proposed Registration Council," that the formation of the much desired Teachers' Council, with which will rest the responsibility of preparing a Register of Teachers, will not be long delayed.

The papers include a summary of proceedings at the conference of November, 1909, convened by the Federal Council of Secondary School Associations in conjunction with other important educational associations; the alternative proposals discussed in Parliament in 1906, and other minutes and important data concerning the formation of such a council of teachers. The most important section, however, is that containing a report by Sir Robert Morant, secretary to the Board of Education, upon three informal conferences held recently at the Board of Education to discuss the whole matter, together with the outline of a scheme for the formation of a Teachers' Council.

This scheme lays great emphasis upon the question of the unification of the teaching profession, and makes provision for full representation upon the council of the universities of England and Wales. On this point Sir Robert Morant says:—

"From the point of view of a council which is to be, above all things, representative of the whole teaching profession, it is obvious that there must be a university group just as much as an elementary group and a secondary group. To speak of a professional council of the teaching profession without a full inclusion of the universities would obviously be absurd."

"Now the number of universities in England and Wales is eleven, and it is obvious that it would be quite impossible for these eleven universities to combine as an electoral college to name (say) five or six individuals to represent them, collectively, on such a council as is here in question, and the only conceivable method of meeting the case is that each of the eleven should have one representative.

"If, then, this group is to be composed of eleven members, this must be equally so in regard to the other three groups, according to the principle already proposed and accepted. . . . The council would thus be composed of four groups, each having eleven members."

The four groups which are each to be represented by eleven members are the university, elementary, secondary, and technological and specialist. In defining the last-named group, Sir Robert Morant remarks:—

"From some of the difficulties that have specially arisen in respect of that part of the scheme, it would seem that its nomenclature is, in some senses, inappropriate, and that what is really in question, on this side, is the need of representation of what may be called 'specialist teachers' (as well as technological teachers), as contrasted with what are usually regarded as teachers in the field of general education, or as 'general practitioners,' as was suggested at my second conference."

"It would therefore seem essential that the Teachers' Council, to be really representative of the whole profession, must comprise a representation of university teachers just as much as of elementary teachers, of secondary teachers, and of technological and specialist teachers; a council composed of these four elements would, in fact, be *representative of the whole teaching profession*, which otherwise would not be the case."

Again to quote the secretary of the Board of Education:—

"It will probably, however, be the case, from the very fact that the council will comprise representatives of widely different points of view as belonging to widely different branches of the profession, that its deliberations will best be managed under the chairmanship of someone not identified with any one of the several branches or sections; and from this point of view it would probably be desirable that the Order in Council should provide one vacancy for a chairman, to be chosen by the council from outside their numbers, who would doubtless be a man of distinction and possessing the characteristics requisite in an effective president of a body of this kind, whose deliberations would constantly be upon matters in which divergent interests and opposing points of view would frequently occur."

"This would bring the total number of the council to forty-five—a large body, but by no means too large to represent adequately the whole of so vast and important a profession as the teaching profession, nor, on the other hand, too large for arriving at effective decisions on the points likely to come before it, seeing that many of the more technical points would first have been thrashed out in special committees, and in meetings of one or more special committees meeting together, before coming before the council to be decided finally."

Mr. Runciman appends a note to the report signifying his agreement, and requesting Sir Robert Morant to have a draft made, as soon as possible, of an Order in Council on the lines outlined above.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—The Harkness scholarship for 1911 has been awarded to Mr. T. C. Nicholas and Mr. J. Romanes. The Frank Smart prizes have been awarded to Mr. S. R. Price (botany) and Mr. S. T. Burfield (zoology).

Mr. C. T. R. Wilson has been reappointed demonstrator of experimental physics for a period of five years from Michaelmas, 1911.

Mr. F. T. Brooks has been appointed senior demonstrator of botany, and Mr. D. Thoday junior demonstrator of botany, both for two years ending September 30, 1913.

WE learn from *The Times* that Mr. Robert Christison, of Burwell Park, Lincolnshire, and late of Lammermoor, Queensland, has telegraphed to Sir William MacGregor, the Governor of the State of Queensland and Chancellor of the University of Brisbane, his willingness to contribute a further 1000*l.* (having already given 1000*l.*) for the foundation of a chair for tropical and sub-tropical agriculture.

IT is announced in *Science* that Mr. Morton P. Plant has offered to give an endowment of 200,000*l.* for the woman's college which is to be established at New London, Conn.; it is a condition that the name shall be changed to the Connecticut College for Women. From the same source we learn that the General Educational Board has made public a list of its latest grants for colleges and schools, amounting in all to 126,800*l.* All the gifts to colleges are conditional and are applied to endowment only. Other gifts may be applied to current expenses. The grants include:—

College	Appropriation	To be raised
	£	£
Converse, Spartansburg, S.C. ...	10,000 ...	20,000
Drury, Springfield, Mo....	15,000 ...	65,000
Franklin, Franklin, Ind.	15,000 ...	65,000
Franklin and Marshall, Lancaster, Pa.	10,000 ...	45,000
Huron, Huron, S.D.	20,000 ...	20,000
Pennsylvania, Gettysburg, Pa. ...	10,000 ...	30,000
Totals	80,000 ...	245,000

Science also states that Brown University receives a bequest of 17,000*l.* from Dr. Oliver H. Arnold, of Providence.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society June 15.—Sir Archibald Geikie, K.C.B., president, in the chair.—Prof. T. G. **Brodie**: Croonian lecture: A new conception of the glomerular activity. All the more recent work upon the kidney has proved conclusively that Ludwig's explanation of the glomerular function, viz. that the glomerulus is a filtering mechanism, is incorrect. The structural details of this highly characteristic portion of the renal apparatus strongly suggest that in some way or other the blood pressure is made use of in the work of the glomerulus. Having excluded filtration in this connection, there is yet another way in which it could be directly utilised, viz. in setting up a pressure-head by means of which the watery part of the urine could be driven through the very long and narrow tubule. In reference to this side of its activity, it is suggested that the glomerulus be termed a "propulsor." An approximate calculation of the pressure-head necessary to drive the fluid along the tubule during the height of activity proves that one about equal to that present within the glomerular capillaries is required. Evidence of the action of a high intra-tubular pressure is at once obtainable from the microscopic examination of a kidney after activity. The capsules of Bowman are greatly distended and approximately spherical in shape, the glomeruli are moderately enlarged and no longer fill the capsular spaces. The tubules are straightened out, stretched, and possess a conspicuous lumen. All these changes are exaggerated by any procedure which favours the action of this intra-tubular pressure, such as a high arterial blood pressure, obstruction to the outflow of urine from the ureter, or the stripping of the capsule from the kidney. Further, the kidney during activity is tense and hard, and distends its capsule to the utmost. This conception of the glomerular function affords a complete explanation of the existence of a firm and inextensible capsule surrounding the kidney, as also of such phenomena as the maximum ureter pressure, the dependence of the rate of discharge of urine from the kidney upon the general blood pressure, and the degree of dilatation of the renal arterioles, &c. Applying