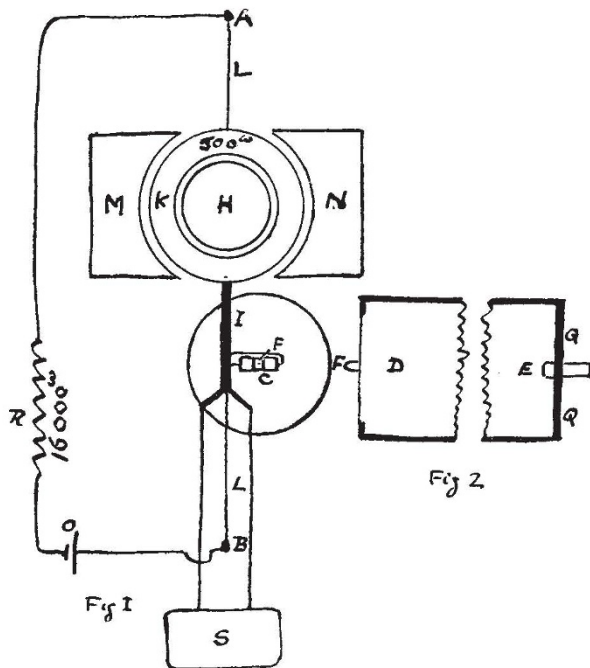


LETTERS TO THE EDITOR.

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A Hertz Wave Receiver.

DURING a visit to Adelaide in December last year, I was asked to suggest some sort of apparatus whereby Hertz wave disturbances might be observed. The result may perhaps be of some interest at the present time. The spark at the oscillator was small, as only a small induction coil was available. From previous experiments made by me, I had discovered that in order to obtain great sensitiveness the distance between the poles of a Branly detector should be as small as possible; also the amount of current employed should be very small. After many experiments, I devised an apparatus in which only about 1/16 of a milliampere gave excellent results. The apparatus was simple and easily constructed. In Fig. 1, MN are the poles of the permanent magnet of a D'Arsonval galvanometer; K, its coil having a resistance of 500 ohms; H, the internal soft iron



— Hertz wave receiver —

fixed core; L L', the flat suspension wires; I, a rod of ebonite to the side of which a minute Branly receiver is attached. This forms a part of the galvanometer circuit, and moves with the coil through its angle of displacement, the ends AB of the suspension wires being fixed to the frame (not shown). The circuit included one small dry cell, O, and a non-inductive resistance of 16,000 ohms. In order that the Branly receiver C, after being made a conductor by the influence of a Hertz wave, may be restored to its condition of high resistance, it is brought up against a point F, when deflected (a side view of this is shown in Fig. 2). This point is kept in a state of vibration by means of a jet of water, thus, D E is a tube furnished with an elastic disc, to which a projection, F, is attached; a jet is so fixed at E that its discharge impinges on the centre of the disc, the jet is fixed to the tube by a bar, Q Q, the discharge is affected by the tube as a resonator, and hence F vibrates. The suspended coil, K, is furnished with a mirror and a pointer, whereby its movements are easily seen. This form of de-cohering instrument was used to avoid the evil effects due to electromagnetic vibrators, which act on a receiver if very sensitive. The induction wings were con-

nected to the apparatus at A and B. On repeating the experiment at home, I found that 1/16 milliampere is by no means the smallest current that might be used; all that is required is a current sufficient to move the suspended coil. I am informed that the current used in wireless telegraphy is usually about one milliampere; it is obvious that by increasing the sensitiveness of the galvanometer a more sensitive coherer may be used. By means of a vane, S, moving in liquid the movements of the coil are damped. The cohering substance was an 8 per cent. alloy, made in the oxyhydrogen flame, and then reduced to filings in the usual way; it was found to be exceedingly sensitive, much more so than the mechanical mixture of filings of the two metals.

I made several attempts to use a sensitive galvanometer for closing the circuit; the results were unsatisfactory, the closing of the circuit was uncertain, and when it was closed the tendency to stick, due to the contacts, was a source of much trouble. It then occurred to me that the whole difficulty would be obviated by attaching the coherer to the moving axis of the galvanometer coil itself, for by this means the contact is entirely avoided, while the coherer is brought within the range of a constantly vibrating projection which causes immediate decoherence. A vibrating reed was tried as a decoherer, but abandoned owing to the trouble of feeding it with air under pressure. Another form of decohering vibrator was also tried, which consisted of a long tube, part of which was glass; each end was furnished with a tympan, one of which was placed as F and D, Fig. 2; the other tympan was led into a metal box containing an electromagnetic vibrator, the hammer of which beat upon the tympan remote from the galvanometer. The electromagnet may thus be placed at a great distance from the apparatus, while its impulses are communicated through the column of air in the tube.

Since my return home, I have used the Wehnelt circuit breaker for producing Hertz waves with ordinary oscillators; the effects appear to be perfect, although the space at my disposal, about two miles, is for the most part covered with houses and high buildings.

F. J. JERVIS-SMITH.

Oxford, August 26.

Is Insusceptibility to Vaccine produced by Small-pox?

If vaccination inhibits, arrests, modifies, or mitigates variola because it is one with variola, if the attenuated virus and local eruption interfere with the more virulent and generalised eruption, may not a reciprocal antagonism be expected? If the minor malady interfere with the major malady, how much more should the major malady, within a reasonable period of years, confer some degree or manner of general constitutional protection in respect of the minor, if not a modification of the local result of vaccination? If I mistake not, systematic investigation on this point, on the human subject, has been strangely neglected in England, if not elsewhere.

CHARLES G. STUART-MENTEATH.

23 Upper Bedford Place, W.C., August 14.

SMALL-POX does leave behind it an insusceptibility to vaccinia. If the writer of the letter will refer to Dr. Monckton Copeman's article on "Variola and Vaccinia, their Manifestations and Inter-relations in the Lower Animals: a Comparative Study" (*Journ. of Path. and Bact.*, vol. ii., 1894, p. 408, *et seq.*), he will find references to the protection conferred by variola against vaccinia. That systematic investigation has not been carried out is probably due to the fact that the subject has so little practical interest.

From the point of view of those interested in the general question of immunity, this subject is well worth careful and systematic study.

G. SIMS WOODHEAD.

THE DOVER MEETING OF THE BRITISH ASSOCIATION.

IN addition to the arrangements described previously, an installation of Marconi's system of wireless telegraphy will be set up in the Maison Dieu Hall of the Town Hall. There will be constant communication with the South Foreland, the East Goodwin Lightship and Wimereux-Boulogne. By means of this arrangement visitors will be kept fully informed of the proceedings of the French Association at Boulogne.