

On A New Electric Radiation Meter

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brass rods .53 cm. in diameter supported horizontally and carrying two zinc plates 40 cm. square, capable of sliding along them so that the wave-length could be altered at pleasure. They were usually kept about 25 cm. apart. The terminal knobs were 2 cm. in diameter and the spark-gap about 2 or 3 millim. It was noticed that one of the knobs blackened very quickly but remained quite cool, while the other, which altered little, became very hot.

The induction-coil employed to work it was 20 cm. long and 12 cm. diameter, and gave with the battery-power employed sparks 4 cm. long between two points. To obtain greater regularity in the working of the coil, a tuning-fork mercury break, vibrating 86 times a second, was used.

By employing a larger coil larger deflexions could, no doubt, be obtained and effects at greater distances observed.

A method was tried for increasing the sensitiveness by weighting the mirror so that its centre of gravity was behind and rather above the axis of suspension. The tension was adjusted so that the spring kept the mirror near its position of unstable equilibrium. The effect was to render the smaller deflexions nearly 10 times as great, while the sensitiveness diminished as the deflexions became larger. But the difficulties of working with it were greatly increased, as the smallest draught of air would alter the zero-point.

Wires of different materials were also tried which should theoretically give better results ; but, probably owing to their diameters not being sufficiently fine for the tension to which they were subjected, the results were not satisfactory. The convenience of being able to compensate the platinum wire by the glass tube seems, however, a great point in favour of the use of platinum, and has led me hitherto to keep to it.

Prof. Perry asked if the E.M.F. required to produce the observed results had been calculated ; he also believed that the sensibility might be increased by using copper instead of platinum, and replacing the spring by a twisted strip.

Mr. Blakesley inquired whether the effect of increasing the capacity of the ends of the wire had been tried.

Mr. Boys said that if the observed effect was due to rise of temperature he would like to see it measured thermally. He

also thought the effect might be due to extension caused by rapid electric oscillations in some such way as the elongation of an iron bar caused by magnetization. In answer to this, Prof. S. P. Thompson said the matter had been investigated experimentally, but with negative results.

Prof. Herschel suggested the use of a compound spring such as are used in Bregnet's Metallic Thermometers.

In reply Mr. Gregory said he had estimated the E.M.F. by observing that a Leclanché cell through 50 ohms produced about the same result. No improvement in sensitiveness was obtained by using copper wire or by increasing its capacity, and attempts to measure the rise of temperature by an air-thermometer had been given up as hopeless.

The President, in thanking the author for his paper, congratulated him on the ingenuity and courage displayed in producing an apparatus to measure such microscopic quantities as are here involved.

XL. *On Electrifications due to the Contact of Gases with Liquids.* By J. ENRIGHT, B.Sc.*

A STUDY of Helmholtz's theory of atomic charges led to the experiments I am about to describe. When one has got the idea that molecules are kept in their integrity by the mutual attractions of the oppositely charged atoms or radicals composing them, a question soon arises as to what part, if any, these charges play in ordinary chemical reactions. The theory precludes any other form of chemical affinity than that due to the mutual attractions of the opposite charges, and it occurred to me that since at the moment of reaction there must be disturbance and re-arrangement of them, some indication of their existence might be obtained by allowing reactions to go on in an insulated vessel properly connected with a quadrant-electrometer. Even if a permanent electrification could not follow, I thought it just possible that a momentary flutter of the "spot" might take place on account of the electric disturbance due to the interchange of the charged ions.