

On the electric charges acquired in high vacua by insulated potassium salts and other radioactive substances.

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Since the discovery in 1907, by N. R. Campbell and A. Wood,¹ that potassium salts possess in a very definite though relatively small degree the property of radioactivity, the radiations from these salts have been examined by a number of investigators including among others Campbell,² McLennan and Kennedy,³ and Levin and Ruer.⁴

Amongst other properties of the rays examined by these investigators was their absorption by different thicknesses of various substances. From the results of such measurements the view came to be held that the rays from potassium salts were heterogeneous and consisted of several types varying in penetrating power from the beta rays of uranium downwards. The average intensity of the rays, moreover, was found to be about 1/1000 of that of the radiation from uranium salts.

In a particular set of experiments which were carried out by Campbell the rays were passed between the plates of a large zinc grid and on emergence their intensity was ascertained from the conductivity they imparted to a mass of gas in an ionisation chamber. This grid was so arranged that alternate plates were metallically connected, and consequently when the two sets of plates were joined to the two terminals of a battery an electric field was established in the intervals between the plates. Campbell found when a field of 8,000 volts was applied to this condenser that the intensity of the emerging rays was diminished by approximately 14 per cent. This led him to the conclusion that the rays consisted of streams of electrically charged particles, and from additional experiments on the direction of the deviation of the deflected beams he concluded that the charge carried by the rays was a negative one.

It followed therefore from these experiments that the rays in all probability belonged to the beta type of radiation.

In some absorption experiments made by the writer, special care was taken to examine the rays from potassium salts for the presence of a

¹ Proc. Camb. Phil. Soc. No. 14-15, 1907.

² Proc. Camb. Phil. Soc. No. 14-211, 1907.

³ Phil. Mag., Sept., 1908.

⁴ Phys. Zeit. 9 Jahr, No. 8, Seite 248.