

from deposits of polonium, to which radiation attention was first drawn by the experiments of Sir J. J. Thomson,<sup>1</sup> Logeman,<sup>2</sup> Ewers,<sup>3</sup> and others.

Makower has also recently used it to measure the beta radiation from radium and from the measurements to deduce the number of beta particles emitted per gram of that substance.

By applying this method to the radiation from potassium salts the writer has observed in certain cases that potassium salts, when insulated in high vacua, acquire a positive charge, but up to the present it has not been found possible from the characteristics of the acquired charge to decide whether this charge arises from the radiation being wholly of the beta type or whether it is due to the emission of rays of both the alpha and beta type with the beta type of radiation in excess.

Among other phenomena observed when applying the method are those associated with the volta effect. If a metallic rod or vessel connected to an electrometer be placed within and insulated from a second metallic vessel, it will be found when both the containing vessel and the insulated vessel are joined to earth, that generally a potential difference will exist between them. This potential difference will, of course, be more marked when the two vessels are made of different metals. It will also, however, be observable ordinarily when the two vessels are made of metals supposedly the same, but in this case the existence of the effect only goes to show that some slight difference exists in the composition of the two pieces of metal used in the construction of the two vessels.

If now with the arrangement just described where one vessel is placed within and insulated from a second the earth connection of the electrometer be removed it will be found that the insulated body or vessel more or less rapidly acquires an electrical charge, the sign of the charge being determined by the direction of the potential gradient. This charge arises from the air or gas between the two vessels possessing a conductivity which is imparted to it either by radiations emitted from the walls of the containing and contained vessels or from the passage through the gas of the penetrating radiation which is known to be present at the surface of the earth. The conductivity possessed by the air will tend to diminish the potential difference set up between the two bodies when they were both joined to earth, and the charge acquired by the electrometer under the action of the conductivity when the earth connection to the inner vessel is removed, will give a measure of the magnitude of the volta effect.

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<sup>1</sup> Thomson, Camb. Phil. Soc., Proc. 13, pp. 49-54, Feb. 18, 1905.

<sup>2</sup> Logeman, Proc. Roy. Soc., Series A, Vol. 78, No. A. 523, p. 212.

<sup>3</sup> Ewers, Phys. Zeit. March, 1906, pp. 148-152.