Radi. activity of Lead and other Metals.

manner to give satisfactory results. If this water proved to be an efficient screen, it would be interesting to see whether all ionization would disappear from the air confined in a cylinder such as No. 1 of this investigation, if it were immersed to a considerable depth in it; for on the assumption that the material used in the construction of the cylinder eontained no active impurity, this is what one should expect to find.

IV. On the Rise in Conductivity of Air confined in Metallic Vessels.

In the course of the experiments described above, it was repeatedly found when one of the cylinders was filled with fresh air filtered through cotton- and glass-wool, and afterwards sealed up, that the conductivity of the enclosed air steadily rose for a number of days, and finally reached a steady value.

This phenomenon, which has been described already by the writer and E. F. Burton in the paper cited previously, has also been observe ' by a number of experimenters, including Elster and Geitel*, Eve†, Wood and Campbell‡, and others, but up to the present has not received a satisfactory explanation.

During the present investigation special observations were made on this effect in connexion with air confined in the lead cylinders Nos. 1 and 2, on account of the great difference observed in the values of the conductivity impressed upon the air introduced into them.

When cylinder No. 1 was thoroughly scoured and cleaned in the manner described in the beginning of this paper, and freshly filtered air blown through it for twenty minutes, a reading of 7.7 divisions per minute, or a number within 1 or 2 per cent. of it, was regularly and repeatedly obtained throughout the period, now nearly six months, during which the observations have been carried on. If the air after being introduced into this cylinder was allowed to remain undisturbed for some time, and measurements made on its conductivity at stated intervals, it was found that the ionization steadily increased, and after a period of a week or ten days reached a value of approximately 11 divisions per minute. If when this stage was reached filtered air was blown through the cylinder for twenty minutes, it was always found that a

C itel, Phys. Zeit. ii. pp. 560-563 (1901); Elster and Geitel, ibid.
ii. 116-119 (1900).

† Eve, Phil. Mag. [6] xii. p. 189 (1906).

1 Wood and Campbell, Phil. Mag. Teb. 1907, p. 265.