II .- On the Radioactivity of Lead and Other Metals.

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(Read May 16, 1907.)

In a paper in the *Phil. Mag.* of September, 1907, Eve states that while investigating the natural ionisation of air confined in vessels made of different metals, he found that 24 ions per ee. were generated per second when the receivers were made of copper, zine, iron, and tinned iron, while 96 ions per ec. were regularly produced in air per second when the confining vessel, were made of lead.

The high conductivity of air contained in lead vessels has been frequently noted by other observers, but from Eve's results it would appear either that lead contains some active impurity from which other metals are entirely free or else that lead possesses an intrinsic radiation very much stronger than that exhibited by other metals.

The view that lead contains an active impurity is supported by a description in the Phys. Zeit. of November, 1906, of some experiments by Elster and Geitel in which they succeeded in extracting from lead oxide small quantities of an active substance which from its characteristics they were inclined to think was radium F. In this paper they state that they were unable to obtain any active emanation from the materials treated, and on this account they suggest that possibly the source of the radium F. can be traced to the presence of radium D in the lead.

Since the decay period for radium D is forty years it would follow. if the high activity of lead is due to the presence of this radium product, that very old lead would exhibit an activity less intense than that which it emitted when freshly mined.

Eve does not appear to have tested many different samples of lead, but if the explanation offered by Elster and Geitel of the high activity of lead be correct, one should expect to find that samples of lead selected at random from different localities would exhibit widely differing degrees of activity.

This difference in the radioactivity of lead obtained from different sources was recently observed by the writers while making some measurements on the conductivity of air contained in metal vessels.

In these experiments the metals examined were made up into cylinders 60 cm. long and 24 cm. in diameter, and from measurements with a sensitive quadrant electrometer on the saturation current through the air which they contained their activities were deduced.