

the lead cylinder entirely unscreened, then with the one half of the cylindrical surface screened internally with aluminium 0.73 mm. thick, and finally with the whole of the inner cylindrical surface covered with the aluminium.

The values are given in Table II.

Table II.

Experiment Number.	Cylinder No. 2.	Ionization (Arbitrary Scale).	Decrease in Ionization (Arbitrary Scale).
1	Completely unscreened.....	54.6	
2	One-half inner cylindrical surface screened.....	32.4	22.2
3	All inner cylindrical surface screened.....	9.87	22.57

and from them it will be seen that the decrease in conductivity was the same for each half of the cylindrical surface. This goes to show that the radioactive impurity in the lead was uniformly distributed over its surface. It was also very probably distributed in a uniform manner throughout the mass of the cylinder as repeated scourings with glass paper failed to remove it. In this connection it is of interest to note that during the last six months, measurements have been repeatedly made on the conductivity of air confined in this cylinder, but during that period no indication of a falling off in the intensity of the radiation from it has been observed.

From the foregoing results it is abundantly evident that the high activity of lead which has from time to time been recorded by a number of observers can not be ascribed to any intrinsic property of the metal, but must be connected with the existence in it, in amounts varying with different specimens, of some foreign body of considerable activity.

The low value obtained for the conductivity of air enclosed in cylinder No. 1 suggested the possibility that the difference between the reading for this cylinder and that obtained with the aluminium cylinder No. 9 was due entirely to a difference in the secondary rays excited in the two metals by the penetrating radiation from the earth. With the object of clearing up this point observations are still being made with the cylinders, and from results obtained already, it would seem that, apart from active impurities, differences in the secondary radiation will suffice to explain the differences in conductivity obtained with air confined in vessels made of different metals.