

second. The lowest value, 23, was obtained with the lead which had been in the laboratory between twenty-five and thirty years, and had probably been a very much longer time away from the mine. With the cylinder No. 4, which was made from an old drain pipe, the value of "q" was found to be 78, a somewhat higher value than that obtained with No. 1. Although both of these cylinders were made of comparatively old lead it is highly probable that No. 4, from the nature of its use had become contaminated with some active substance. It may possibly too have possessed a higher activity than No. 1 when originally mined.

With cylinder No. 5 the value obtained for "q" was 34 ions per cc. per second. This lead, we have reason to believe, was mined not more than two or three years ago, and under the circumstances might have been expected to show a much higher activity. Its activity however, was practically the same as that of No. 3, which was selected at random from a commercial sheet of lead which probably had been on the market for some years.

Cylinders No. 6 and No. 7 possessed a moderate activity compared with the others of the same metal. The number of ions per cc. generated in air per second with them being 45 and 61 respectively.

With cylinder No. 2, the greatest ionization was obtained, the value of "q" in this case being 160 ions per cc. per second.

This cylinder was treated precisely the same as the others, but on account of its high activity special measurements were made with it in order to investigate more fully the character of the radiation which it emitted.

Measurements on the radiation from this cylinder showed it to be in great measure an easily absorbed one. When aluminum linings 0.73 mm. thick were inserted in cylinders No. 1 and No. 2, and No. 3 and measurements made on their saturation currents the values of "q" were found to be 12.0, 13.3, and 14.4, respectively. These numbers it will be seen, are slightly lower than those found for aluminium alone, which is exactly as one would expect owing to the absorption of the penetrating rays from the earth by the lead. The value for "q" 13.3 found for No. 2 is slightly greater than that "q"=12 given by No. 1, although this lead cylinder was 2.25 mm. thick, while No. 1 was only 1.85. This would seem to indicate the existence of a slight penetrating type of radiation issuing from No. 2 which was absent from cylinder No. 1.

A second series of measurements was made with cylinder No. 2 to investigate the distribution of the substance which was the cause of its high activity. Readings were taken on the saturation current first with