## Radioactivity of Lead and other Metals.

the reductions were made, we have

- $I_{lp} + I_{ls} = 90.05$  . . . . (iv.)
- $I_{lp} + I_{as} = 49.5$  . . . . . (v.)
- $I_{ls} = \frac{100}{28.6} I_{as}$ . . . . . . . (vi.)

and

From which we have

 $I_{lp} = 33.05$   $I_{ls} = 57.00$   $I_{as} = 16.3,$ or  $I_{ls} = 1.735 I_{lp},$ and  $I_{as} = .493 I_{lp}.$ 

Similar ealculations were made on the readings obtained with eylinders Nos. 2 and 3, and the results of the three are recorded in columns 4 and 5 of Table V. From these it will be seen that the ionization produced in the air in a lead cylinder by the gamma rays from radium is only one-half that produced in it by the seconda; y rays excited in the lead walls by these same rays. On the other hand, with gamma rays of the same intensity entering an aluminium cylinder of the same size as the lead one, the results show that the ionization produced by the penetrating gamma rays is approximately twice that produced by the secondary rays excited by these gamma rays.

It will also be seen from the numbers given in the above table, that we have sufficient data to calculate the ionization produced by the radium in a cylinder of any material of the same dimensions as those used in this investigation, provided it was placed in the standard position indicated above.

For example, Colum 6 of Table V. gives the reduced readings corresponding to the gamma rays alone which entered the respective cylinders. From Table III, the absorption powers of these cylinders are known in percentages; and by means of these numbers values can be calculated for the ionization which would be produced in the same volume of free air by the gamma rays from the radium. Column 7 of Table V. cont. us the values of  $I_{lp}$  corrected in this way, and the mean of the results is 36.3. This number, it will be seen, represents the ionization which would be produced by the gamma rays from the radium, v ed in these experiments in a cylinder of any metal 60 cm. high, and 24 cms. in diameter, situated in relation to this radium exactly as the cylinders were in the experiments described above on the

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