

pressure. When the pressure was taken below $1/100$ of a millimetre the charging action became very marked and produced rapid deflections beyond the limits of the scale.

A set of readings taken with this polonium coated copper strip in the neighbourhood of the initial rise due to the radiation is given in Fig. 1, and a curve drawn from the readings is shown in the same figure. This curve is typical of the different ones obtained with this active product.

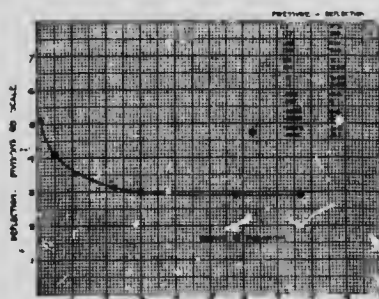


FIG. I.

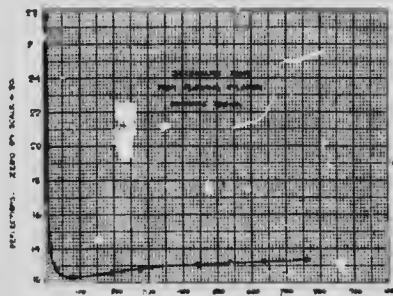


FIG. II.

It shows quite clearly that this substance emits an excess of negatively charged particles, and it also exhibits very definitely the pressure at which this excess comes into evidence.

III. CHARGING ACTION OF SECONDARY RAYS EXCITED IN ALUMINIUM BY THE GAMMA RAYS FROM RADIUM.

In this experiment one milligram of radium was enclosed in a small sealed glass tube, whose walls were about 2 mms. thick. This glass tube was placed inside a tube of aluminium, which was then closed at the top and bottom. This tube, which was about 7 cm. in length and had walls about 2 mms. in thickness, was then insulated as before and suspended in the brass cylinder used in the last experiment. In this experiment the charging action was very much more marked than in the experiments with polonium. It also exhibited certain characteristics which were not observed in the measurements with that substance.

A set of results which illustrate its behaviour is given in Table II, and a curve plotted from them is shown in Fig. II. When the outside vessel and the free system were joined to earth the zero reading on the scale was 20, and as soon as the earth connection to the quadrants was removed the needle moved out at once in the negative direction and took up a position at 13.3. When the pressure was lowered the negative charge on the quadrants gradually increased, but ultimately at a pressure of about 80 mm. this acquisition of a negative charge ceased and