Again, with the cathode *A* well earthed, *B* being the other terminal, a large negative charge was induced when the earth connection to the cylinder was made through the wet string; but when *B* was put to earth instead of *A* only a feeble inductive action was obtained. With *A* as anode and *B* cathode and the wet string inserted as part of the earth circuit there was a large positive induction if B was put to earth and but little when *A* was earthed. In both these cases the action was much more intense when the column of xylol replaced the wet string.

At higher pressures such as one millimetre of mercury the action again varied with the conditions of the experiment. When *A* and *B* were the electrodes and neither connected to earth a small positive induction was observed when the column of xylol was inserted, but none when the connection was made by means of the wet string. On the other hand when one of these electrodes was well earthed there was a very strong positive induction such as that obtained at much lower pressures.

The experiments in this direction were not carried further, as the presence of this inductive action was sufficient to show the importance of having good earth connections in investigations of this class.

From these results it appears highly probable that the sudden deflections obtained in the experiments described in section I may be traced to this cause, as in that case the earth connections were simply made by means of a platinum wire placed in contact with the cylinder.

5. Influence of Small Openings in the Faraday Cylinders Inserted in Vacuum Tubes.

While electric conduction along the surface of the glass appeared to explain the effects described in section I, it was also thought possible that the effects might be due in a measure to the presence of the small opening *c* in the cylinder *D*, Fig. I.

A similar opening existed in the cylinder of the tube shown in Fig. IV, but, as in this case the hole could be readily closed by simply raising the mercury, this form of tube was well adapted to investigate the influence of such openings.

To investigate this point a series of experiments were made with the mercury lowered. The disc *d* was made of metal thick enough to cut off the cathode rays, and a discharge was passed through the tube at pressures both high and low, each of the electrodes *A*, *B* and *D* being in turn selected as the cathode.

As a result of the tests no evidence was obtained of the presence of electrical charges within the cylinder except in one case.