From the numbers given in the table it will be seen that immediately after the brass began to cool down to the temperature of the liquid air the pressure in the apparatus rose slightly and then fell again as the pumping was continued. The rate at which the polonium charged up, however, steadily decreased as the brass plate cooled down. As the effect of a rise in pressure would be to increase the ionisation current in the chamber it follows from the occurrence of this decrease in the rate of charging of the polonium that the secondary radiation from the brass plate must have dropped off as its temperature lowered.

The values of the α ray excited secondary radiation from the brass plate at temperatures 20° C and -192° C as deduced from Tables XIV and XV are given in Table XVI.

TABLE XVI.—BRASS IN AIR.

Secondary Radiation from Brass and Air Layer.

| Temperature of Brass.... | 20° C | −192° C |
|---|---|---|
| Secondary Radiation..... | −215 | −173 |

From these numbers it is evident that the secondary radiation from the brass at a temperature of 20° C was about 25% higher than it was under the same α ray bombardment at the temperature of liquid air.

If differences in α ray excited secondary radiation at low pressures be taken to connote differences in the quantities of gas occluded at the surface of the substance bombarded, the meaning of this smaller secondary radiation from the brass at liquid air temperature is that the brass held less gas in its surface at liquid air temperature than at the temperature of the room. This experiment therefore, strongly supports the explanation given above of the greater difficulty experienced in pumping the air from the brass chamber at -192° C than in making the same exhaustion when the apparatus was maintained at the temperature of the room.

## V.—SUMMARY OF RESULTS.

I. The secondary radiation excited by the α rays of polonium in carbon was found to increase in intensity as the temperature of the carbon was lowered from room temperature to the temperature of liquid air.

II. This increase in the secondary radiation from carbon as its temperature was lowered has been shewn to be due to an increase in the amount of gas occluded in the surface of the carbon.