only from the surface of the different radiators, but from a considerable depth as well; and since the zinc used in these experiments was only 1·62 mm. in thickness, it was probably not so thick as the plates used by him. A smaller value should then be assigned to the ionization produced by the secondary radiation from the zinc walls; and if this were done, the calculated and the observed values for zinc would come into better agreement.

The argument which has just been used to explain the high ionization calculated for the zinc cylinder would apply with still greater force to the secondary rays from aluminium. With this metal Eve found that the secondary radiation came from as great a depth as 3 mm.; and if this condition holds generally for aluminium, it follows that we have assigned for this metal also too high a value to the ionization produced by the secondary rays. A reduction should then be made in the calculated value for "q" of 14·22 ions per c.c. per second, and as this value is already slightly below the observed value of the number of ions generated per c.c. per second in the aluminium cylinder, this reduction would leave a correspondingly greater number of ions to be accounted for, very probably by the presence of active impurities in the substance of the receiver.

It is of special importance, however, to note the fair agreement which exists between the calculated and the observed values, in these experiments, for the ionization produced in air enclosed in cylinders of lead, zinc, and aluminium, as illustrated by the numbers given in Table VI. for Cylinders Nos. 1, 8, and 9, since it emphasizes the view that ordinary metals do not possess any intrinsic radiation, and that when any high conductivity is observed in air confined in metallic vessels, it must be due to the existence of quantities, more or less considerable, of some foreign radioactive substance in the metals.

Examples of such contamination are clearly in evidence in the results given in Table VI. for the lead cylinders Nos. 2 to 7 inclusive; and the numbers given in Column 6 give an estimate of the relative amounts of the active impurities present in the different samples of lead used in their construction.

In what has preceded in this Section the discussion has rested upon the assumption that the lead in Cylinder No. 1 contained no active impurity; and while the experimental results rather fit in with the deductions which have been made on this hypothesis, there still remains the possibility that some part of the ionization observed with this cylinder