charged particles. What now will be the deflection of such doubly charged particles? When it is remembered that, although they have a double amount of energy, on account of their double charge the electric deflecting force due to the plates P_1 P_2 (figure 3) is also doubled, it will be seen there will be no change in this deflection. Whence, then, comes the prolongation of some of the curves? This is the result of what is known as *re-combination*, a phenomenon always occurring in ionized gases. Positively charged particles sometimes "pick up" a free negative electron, thus forming either a neutral body or one whose positive charge has been lessened by one unit. That this is going on in positive ray tubes is evident from the fact that there is always an *undeflected* central spot. (See figures 5, 6, 7.) This spot indicates the presence of rays originally positively charged, which have been neutralized as a result of recombination. Since then we have neutral rays, it is reasonable to suppose that we may have in the observation chamber rays which, while primarily doubly charged, have picked up an electron and possess only one unit charge. Such rays pass through the narrow tunnel with a double supply of energy, but, on account of their ultimate single charge, are subject to a deflecting force by plates P_1 and P_2, of only the normal amount. Their deflection therefore is only half the normal amount and we have a prolongation of the curve corresponding to such particles. In a similar manner the cases of particles which have lost various numbers of electrons and regained some may be worked out.

A good illustration of the evidence of multiple charges is given in figure 7. In this photograph the prolongation of line I corresponds to atoms of the element argon which originally lost three electrons, and later regained two; line III, to those which lost three and remained in this condition. The prolongation in line II is caused by atoms which ,originally minus three electrons, have picked up one electron before entering the deflecting field. It will be noticed that in this case the prolongation extends to a point two-thirds of the normal distance from the vertical.

This method of analysis, therefore, gives us information concerning the physical nature of the substances investigated. A concrete example will perhaps make clear what is meant. A vessel containing a small quantity of oxygen has been shown