

taining but little. The structure of the bark shows that the intercellular spaces are large and frequent, the cells arranged without order, irregular in form and size, and with relatively thin walls.

We are now to inquire what relation, if any, these histological conditions bear to the chemical constitution of the ash already referred to, and particularly to the chemical results derived from an examination of the tree restored to health by treatment.

1st. In the normal plant, the full exercise of its functions of growth and a normal histological condition occur, when potash and chlorine are relatively in excess and lime is relatively wanting.

2nd. In the diseased plant, the imperfect nutrition and distribution of the reserve products, as also modifications of the cellular structure, are associated with deficiency of potash and chlorine and excess of lime.

3rd. We are to inquire as to the relation in which the restored tree stands to all of these.

The chemical analyses already referred to show that, when the restoration from abnormal to normal functional activity occurs, the chemical constituents change their relations to those observed in the normally healthy, i. e., the potash becomes in relative excess. At the same time, the histological conditions show a corresponding change, and as the new growth develops, the structure and also the cell-contents assume precisely the conditions of development and distribution found in the naturally healthy tree.

These results may be regarded as fairly conclusive so far as this particular disease is concerned, but we can as yet hardly apply generally the laws here determined. However, the fact here developed with reference to the distribution of the reserve material will not apply with equal force to other trees or plants, since there are very important variations in this respect, dependent upon the physiological characteristics of particular species, or at least of particular families of plants. Nor will the same chemical elements, or the same chemical compound, be equally efficient in all cases in determining a similar result, since here, also, the effect is determined by specific physiological peculiarities. This is well illustrated in the peach and the pear: both belong to the same family *Rosaceæ*, yet the peach belongs to the group *Amygdaleæ*, while the pear belongs to the group *Pomeæ*, indicating at once specific physiological differences. And while