

## HOW THE APPLE TREE GROWS.—I.



THE "Life History of an Apple Tree," was the subject of a very interesting address recently given before the Fruit Growers' Association of N. S. by Prof. Wm. Saunders. He first showed its development from the seed, viewed from the standpoint of a botanist. He spoke of the soil and its ingredients, and its capability of holding in reserve the elements of fertility required by the apple tree. The soils of Canada had been proved, upon careful analysis at the Central Experimental Farm, to be as rich in fertility as the best soils of Europe. Trees take a large part of their nourishment from the air, seizing upon the carbon dioxide exhaled by animals and converting it into woody tissue, and starchy and carbonaceous matter. The ash remaining from the burning of 100 lbs. of wood is usually less than two per cent. These ashes, said the Professor, are said to contain about  $3\frac{1}{2}$  of potash, and about  $3\frac{1}{4}$  of phosphoric acid, and a much larger proportion of lime. This is according to the analysis of Erdiann in Germany, and on this basis an apple tree would take from the soil for the production of 100 lbs. weight of wood, estimating the ash at two per cent., less than one ounce each of potash and phosphoric acid, and probably not more than three or four ounces of nitrogen. This is all of the important fertilizing constituents of the soil which the tree takes up for the production of 100 lbs. weight of its woody frame, during the whole period of the growth required to produce that weight.

Let us next consider the constituent parts of the leaves, which, however, are eventually all returned to the soil by their fall and gradual decay. The leaves of several varieties of apples have been analysed by the chemist of the Experimental Farms at different stages in their growth, with the following results: Gathered on the 25th of May, when they were not fully expanded, each 100 lbs., contained on an average about  $\frac{3}{4}$  of a pound of nitrogen (.742), a fraction less than  $\frac{1}{4}$  of a lb. of phosphoric acid (.248), and a fraction over a  $\frac{1}{4}$  lb. of potash (.252).

The mature leaves collected on the 20th of September were found to contain, when compared with the newly-expanded leaves, larger percentages of nitrogen and potash, and a smaller proportion of phosphoric acid. The nitrogen was present in the proportion of .867, nearly 9-10ths of one per cent.; phosphoric acid .104, or nearly 1-5th of a lb. in 100 lbs.; and the potash .392, or nearly 4-10ths of a lb. in each 100 lbs. of the leaves.

If we examine the fruit of the apple, we find it to consist mainly of juice,