

a heavy clay soil is that its particles tend to pack so closely that air circulation is, to an extent, prohibited. The addition of air-slaked lime corrects this bad condition.



THE FOOD OF THE PLANT.

Beside the plant's having a suitable home, it must have suitable food, if it is to thrive and do its best. Before we make a definite study of the food of plants, it will be interesting to recall the story of how the plant feeds. The accompanying chart tells this story in graphic form. The roots are the trunk lines bringing up the raw material,—the dissolved salts of the soil,—to Nature's factory, the leaves of the plant. The green material of the leaves is Nature's machinery. Under the action of sunlight this machinery is set in motion and the raw material brought up in solution by the roots is re-combined with the constituents of water and carbon-dioxide gas which the plant gets from the air, and is built up into starch, protein, fat, fiber, sugar, and other plant constituents.

The plant is made up of 13 constituents, 12 of which it gets largely from the soil. One constituent which forms about 40 to 55 per cent. of the normal plant composition is taken in through the leaves. It is known as carbon-dioxide. Of the 12 remaining consti-

tuents, 8 are classed as essential and 4 are classed as unnecessary. They may be taken up by the plant, but they do not perform as far as is known, any essential function in the process of plant growth. Of the 8 essential constituents, all but three are perfectly familiar to this audience. On account of the increasing scarcity of the last three constituents, — nitrogen, phosphoric acid and potash—the world has come to look upon these as the essential plantfood constituents. As a matter of fact they are no more essential than the other 10 constituents, yet the ease with which they are depleted fully warrants the great amount of attention that is being given to their up-keep in the soil.

NITROGEN.

A soil deficient in nitrogen, shows its shortage by producing a short strawed grain crop. Nitrogen seems to be the constituent of plantfood that has to do with the growing of the stalk of the plant. An unbalanced supply of nitrogen may cause too great a growth of stalk or straw and result in an inferior quality of grain or other products. Too much nitrogen also produces a slow ripening crop, and one that is easily attacked by disease. Nitrogen is never used in its pure gaseous form by the plant, but is taken up from the soil in soluble salt form, or in certain other organic forms.

PHOSPHORIC ACID.

Phosphoric acid seems to have an important bearing upon the ripening of the crop. On soils deficient in phosphoric acid, the crop does not ripen within the growing season at its disposal. This constituent should be especially interesting to farmers of Ontario,—particularly those who are intending to grow a large type of silage corn. Your season free of frost is shorter than that which prevails in