

our place beside the nest, saying to the still agitated juncos: "Much ado about nothing." What a pity the birds cannot discriminate between their friends and their enemies.

Other varieties of warblers were to be seen or heard but not in any great numbers. The chestnut-sided warbler, always rare enough with us to be regarded as a lucky discovery, was noted. A single female was seen nervously flitting about the lower growths. On a white willow in full bloom by a little spring we discovered a northern parula warbler. The whole tree was a-buzz with insects. As we watched the warbler he came down to the lower branches and almost peeped into my field-glass. A bumble-bee flew around him but he had no desire to snap him up as he did the flies. In fear he flew from the bee. Last May we watched a pair building a nest in a bunch of usnea lichen. This warbler is greyish blue above, with a yellowish patch on the back which makes identification easy. Only one myrtle warbler was seen, and that on the lower slope of the mountain, high up in a spruce. His four yellow patches on each side of the breast, on the crown and on the rump, make him easily recognized. He has been with us since May 2, being one of the earliest warblers to arrive in the spring.

Passing out into the carriage road that crosses the mountain, a male ruffed grouse ran across the road in front of us. He seemed innocent of all family cares as he ran over the dry leaves and disappeared. In the deciduous trees along this road we came upon a bird rare enough in these parts to make the day a red letter one for us. Three male rose-breasted grosbeaks delighted us with their joyous morning carol. The males with their rosy breasts, and black-and-white plumage were conspicuous enough, but the brown, sparrow-like females were not noted.—(Rev. G. C. Warren, Bridgetown, N. S., June, 1915).

ROOTS

When we look around us at the growing things in the vegetable world—the trees, shrubs, herbs, and grasses—it is easy to overlook the roots, simply because they are hidden. But the fact that they are hidden does not mean that they are unimportant. On the contrary, they form a very important part of every plant, and have their own work to do. When we plant a seed the first part to grow is the radicle, which becomes the root. The young plant has no chance in life without a root, because the root gives life and strength to the baby plant and becomes the mainstay of the old one.

We see, then, that roots are important. If any one imagines that an ordinary plant could flourish without one, it is only necessary to find some healthy plant (a weed will answer), and cut off the root. The result soon proves to us that any plant would wither and die were its

roots cut away. The farmer could tell us a tale of insects getting at the roots of his crops and interfering with their growth, which would further convince us. Yet in spite of all this, there are a few plants without roots. It suits their way of life to take in food by other means. Such a fact only proves to us how few hard-and-fast rules there are in Nature.

The Work of Roots.—Having proved that the root is important, it remains to find out exactly the nature of its work. But we must first understand that not every underground part of a plant is a root. Sometimes stems are found underground, so that we naturally wonder how we shall distinguish roots from underground stems. As a rule *if we find buds, then our underground portion is not a root.*

Now try to answer these questions correctly. Is an onion a root? What would you call a potato? When you dig up a fern, would you name all the underground portion its root?

Let us now find out the work of roots. Remembering that the root always appears first when seeds germinate, we naturally conclude that its main function is to anchor *the plant in the soil.* Without roots every plant and tree would be blown down in a wind; but when once the roots have gained firm hold it takes a lot to move a mighty tree. But anchorage is not the only work of the root. It has also the very important duty of *absorbing water and mineral salts from the soil.* We may say that the root helps to feed the plant, for it gives it both food and drink. The food is taken up in solution, just as we might eat a lump of sugar by letting it dissolve in some hot tea. The sugar passes into our body just in the same way that various minerals pass into the plants. It is not quite true to say that the minerals taken in from the soil in solution are good foods. In most cases, at least, they are only the raw materials which have to be worked up into good foods by the plants before they can really make use of them. This "working up" takes place in the leaves.

Holding the plant in position and feeding the plant are the two main functions of roots, but there are others. In the case of *biennials*, that is, plants that live for two years or seasons, swollen roots *form reserves of food* material for the plant's use during its second year of growth. Man makes use of this by digging up these underground larders to stock his own.

In the case of the ivy plant we find roots growing from the stems, merely as *claspers*, to aid the ivy in holding out its leaves to the light.

As a general rule, we say that buds on an underground growth point to its not being a root. Yet this does not always apply, for in some instances, such as the raspberry, the plum, and the elm, buds are formed on roots and the root becomes, in effect, a stem. Nature has many and varied ways of spreading her children