

## THE USE OF THE END-BUDS (TERMINAL BUDS).

But the end-buds, what do they become? Let us reason that out. The side-buds become branches. The end-buds resemble the side-buds very much. So one would suppose that the end-buds would develop into something very like a branch.

The argument may now proceed thus: There is a bud on the end of the main branch this autumn, so there must have been a bud where the branch ended last autumn. But where did it end last autumn? This may be found by observing that the bark near the end of the branch is fresher and lighter in color than it is lower down on the branch; and where the newer-looking bark meets the older bark, a little above the last small branch on the main branch, a ring more or less distinct will mark the position of the terminal bud of last autumn. But there is no terminal bud there now, but in its stead a continuation of the stem bearing leaves just as do the little branches from last year's side-buds. This prolongation of the main branch has, probably, increased its length by several inches. Buds will also be found at the ends of the branches of the main branch. These buds would, next year, have grown out and made these branches longer. What would the result be, then, if the terminal buds were broken off from the main stem and the branches of a tree, or of a smaller plant?

## RELATIVE ARRANGEMENT OF LEAVES, BUDS AND BRANCHES.

A branch bearing opposite leaves — a maple branch, for example—may be studied next. The children will notice that the side-buds are also in pairs, and will infer that since side-buds become branches, the branches should also be in pairs. Often, however, a branch will be found with no opposite one. How is this explained? One of the buds did not develop, or else the branch died or was broken off. Thus we learn that trees with alternate leaves will have alternate buds and branches, while those with opposite leaves should have opposite buds and also opposite branches, except where a bud has failed to produce a branch.

## ON WHAT PARTS OF THE BRANCHES THE LEAVES ARE FOUND.

Get the children to find to what parts of the branches this year's leaves are attached. This is most easily seen in trees, such as the mountain maple, in which there is a marked contrast in color

between the bark on the parts of the branches which grew out this year and that of last year's growth. The young searchers will soon find that the leaves are all on the branches or parts of branches which grew out this year, and will see that, in all trees and shrubs whose leaves fall in autumn, the outgrowth of last year, and of previous years, will never bear leaves again. Ask them to observe the effect of this habit upon the foliage of a tree.

## WHY THE LEAVES FALL.

Another tradition, very common among children and grown-up people, is that the leaves are pushed off the trees in the autumn by the buds. The fallacy of this notion may be found by a close examination of the parts. It will be noticed how easily the leaves of the alder are pulled off at this season, and that they part along a plane which crosses the leaf-stalk near its base. Here the leaf-stalk, it will be found on trial, has become very brittle, as if in preparation for the fall of the leaf. Late in autumn a gentle wind will cause large numbers of leaves to break off at this place; but you will find the leaf-stalk quite tough elsewhere throughout its length.

## THE AUTUMNAL COLORS OF LEAVES.

Still another tradition which deserves investigation is the commonly accepted one that the frosts of autumn cause the leaves to assume their various autumnal colors. —No teacher should let October pass without directing the attention of the children to the autumnal glory of our Acadian woods. If any of the grander aspects of nature will appeal to them, this surely will. A walk with a group of children—not too many at one time—through a near-by wood will be enjoyed by all. Let the children gather the different kinds of leaves from the ground, and find the tree from which each fell. Note its size, mode of branching, general form, the autumnal colors of the leaves, and other obvious features. See that each child gets its name, and set each to find other trees of the same species. By such a method much may be learned about the trees in a few short excursions. The leaves collected may be taken to school and kept in books as material for drawing exercises.

Professor.—“Too bad! One of my pupils, to whom I have given two courses of instruction in the cultivation of the memory, has forgotten to pay me, and the worst of it is, I can't remember his name.”