

TREES AND SHRUBS

“EYES AND NO EYES” SERIES

by ARABELLA B. BUCKLEY

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“EYES AND NO EYES” SERIES Book V

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BY

ARABELLA B. BUCKLEY



**YESTERDAY'S CLASSICS
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CHAPTER I

THE VALUE OF TREES

I wonder if you have ever stopped to think how useful trees are in the world. We saw in Book III. that plants make the air pure for us to breathe. Trees, with their hundreds of leaves, do a large part of this work, and they do a great deal besides.

Let us imagine a little tree growing up in the wood, or in the field. It may perhaps be eaten away by rabbits or squirrels before it is a year old. If so, it has been useful as food. But if it grows up, it begins even the first year to drop some leaves in the autumn, and these help to make leaf-mould, and so give food for other plants.

So it goes on each year, making leaves, purifying the air, and producing leaf-mould. But very soon insects begin to make their home in the young sapling, for every kind of tree has some insects living on it. A moth comes and lays her eggs under the leaves, and the caterpillars feed on them when they are hatched. A beetle comes and lays her eggs in the bark, and the grub feeds there,

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till it turns into a beetle, or till the woodpecker or the nuthatch find and eat it.

In this way every tree is quite a little colony of living creatures. Then the birds come and sleep in its boughs at night and build their nests there in the spring. If the trees are elms the rooks often choose them for their rookery. If they are firs in a wood the woodpigeon will sleep there, or pheasants and hawks perch on their branches, while the thrush and the blackbird spend the night in laurels, or hollies and other evergreen trees.

When the tree has grown big it bears flowers and fruits. These fruits, or the seeds in them, serve as food for many creatures. The birds feed on the berries, the nuts, and the acorns. The squirrel makes its home in the beech-trees, and eats all kinds of nuts it can find. The field-mouse, hedgehog, and pig make good meals off the beech-nuts and acorns on the ground, while we eat the fruit of the sweet chestnut and the walnut tree, the apples, pears and cherries from the orchard.

How useful the trees are to man! They help to keep the ground moist and fresh. There is always more rain in a country where there are trees, and the ground would grow parched and dry, if it were not for their pleasant shade. How the cattle gather under them, when the sun is bright, and stand chewing the cud so peacefully out of the glare and heat! And how glad you are on your way to school, if you can walk through a shady lane instead of along the high road. Then they

THE VALUE OF TREES

are so beautiful in the spring; when the fresh green leaves burst out they make us glad to think that every year tree-life begins again.

On the other hand, some trees are so old, several hundreds of years, that they remind us of times long gone by, and make us love our country when we think what a long history those trees could tell.

But even trees must die at last, and, if they are to be of use to us we must cut them down before they decay. Then, after the tree is dead, how useful it is!

Let us just go through one day of your life, and see how much of a tree you use. You get up in the morning, and the first thing to be done is to light a fire with wood. You sit on a chair: that is made of wood. You open the door that is of wood too. You take up your umbrella when you start for school: the handle was once the bough of a tree. You go upstairs to fetch your bag: the stairs are made out of planks. You set off on your way, and have to cross a brook: the bridge is made of wood. You are careful to shut the gate of the field: that, too, is made of a tree, and so is the paling round the school.

You take your place in class. Your feet rest on deal planks which come from the fir-tree. You sit on a wooden bench. Your slate has a wooden frame. Your pen has a wooden handle. The teacher puts up a wooden easel and a wooden blackboard upon it. She opens the ink-bottle to fill the inkstands, and the cork of the bottle

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comes from the bark of a tree, while the ink itself is made with acid which comes from a gall made by an insect on an oak-tree.

Dinner-time comes. Surely, now, you will not want any wood. You fetch your basket with your dinner in it. That may be made of wood-chips or willow twigs, and the pastry which you eat is made of paste, which your mother rolled out on a wooden board with a wooden rolling-pin.

As you come out from school you get a lift in a farm-cart, that too is made of wood, and so is the wheelbarrow you use, when you get home, for wheeling manure into the garden. You put your school things away in the old oak-chest in the corner, and when you go to bed after supper, you look up at the old beams across the ceiling and fall asleep dreaming of wood everywhere.

You could add many more things that I have forgotten; and even now we have not reckoned up the gums, the turpentine, the oils, the tannin, and the many sweet scents which we get from trees. Nor have we spoken of boats, and railway carriages, nor of the beautiful wood-carvings in our churches and other public buildings. Surely the world would get on very badly without trees!

Name any things made of wood besides those given in the lesson.

CHAPTER II

HOW A TREE STARTS

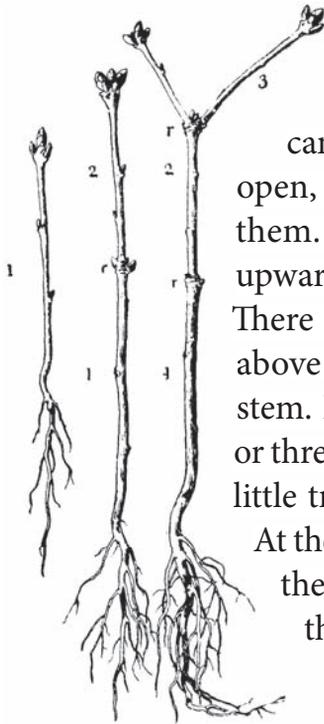
WE saw in Book III. that some plants live much longer than others. Some live for one year only, make their seeds and die. These we call *annuals*. Others live two years. They grow their roots and leaves one year, and flower and make their seeds the next year. These we call *biennials*, because *bi* means two. Others live for many years, and are called *perennials*. Trees are perennials, for they live for very many years. There are some oak trees more than a thousand years old.

Yet all these old trees began their lives as little seedlings, like the bean you grew on the top of the earth in the flower-pot. How, then, have they managed to live so long? We shall learn this best by looking at a young seedling.

If you poke about in a wood, you will easily find some small plant, either of oak, or beech, or hazel, which has grown up from a nut, or an acorn trodden into the ground. I am going to take an oak tree, because I have one close to my door and can give you a picture of it. If you get an acorn and stick it in the neck of a

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bottle, the same way up as it sits in its cup, and keep the bottle full of water, you can grow a small oak for yourself, and see if yours is like mine.



YOUNG OAK PLANT

- 1. Growth of 1st Year
- 2. Growth of 2nd Year
- 3. Growth of 3rd Year
- r. Ring left by scales of buds

First the acorn puts out some roots downwards. Then the husk splits, and you can see the two thick seed-leaves open, with the growing tip between them. This tip now grows steadily upwards and soon puts forth leaves. There may be one, or even two, one above the other, on the sides of the stem. But there will certainly be two or three close together at the top of the little tree by the time autumn comes.

At the foot of each leaf, nestling up to the stem, will be a little bud, and at the end of the stem will be a stout bud, bigger than all the rest.

The difference between the oak-plant and the bean which we grew in Book III. is that the stem is woody. If you get another oak-plant of the same age from the wood, and cut off its head this is what you will see (Fig. 1, p. 7). In

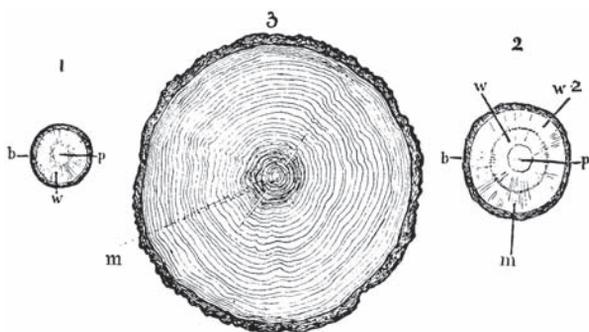
the middle there is a round white patch, *p*. This is the *pith*, or soft part, which you scoop out of the branch of

HOW A TREE STARTS

an elder-tree when you make a popgun. Next comes a ring of soft whitish *wood*, *w*. Outside this again is the *bark*, *b*.

Now you know that water, with earthy matter in it, has to rise up from the roots and go to the leaves, to be made into food. It travels up through this ring of living wood, and when it comes back it makes new wood and new bark just where the wood and the bark meet. You know how easy it is to peel the bark off wood. That is because the tender new part is between them, and gives way easily.

But as soon as autumn comes, the roots leave off taking in water; and the crude *sap*, as it is called, does not rise up any more. The stalks of the leaves dry up where they join the stem, and they fall off. The tree rests for the winter.



OAK STEMS CUT ACROSS

1. Twig of 1st year 2. Twig of 2nd year
3. Trunk of an old Oak with rings of growth
p. pith *w*. wood *b*. bark.
*w*2. Wood of the 2nd year *m*. Medullary or Pith ray

TREES AND SHRUBS

Now watch your little plant next spring. You will see the big bud at the tip, and often two other buds close to it, begin to grow into branches and have leaves of their own. But in a very young tree the smaller ones usually die away and the trunk grows straight up. However, you can always tell where the new growth began in the spring, because there is a ring (r, p. 6) left by the scales of the buds. The wood of the new piece will be just like the wood of the lower piece was last year. But that lower piece will be growing some fresh wood and getting bigger (Fig. 2, p. 7). The sap will go up and down as before, and a new ring of wood (w_2) will form *outside* the old wood, and a very thin new ring of bark *inside* the old bark. So at the end of the second year, while the new piece will have only one ring of wood, the old piece below the scales will have two rings (w and w_2), with a mark between the rings, showing where the tree rested in the winter.

All this is rather difficult to see in such small trees, and you must look at the diagrams. But if you go into the wood when they are cutting down timber, you will see the rings much more distinctly in the older trees, and you will like to look at the trunks, and try to make out how old the trees are. You cannot be quite sure that you count all the years, because as the new wood grows, the old is squeezed together, and makes a very hard wood, called "heart-wood," in the middle of the trunk. But you can be sure that the tree is not

HOW A TREE STARTS

younger, and most likely much older, than the rings you can count.

Now to come back to our question, how trees live to be so old. Year after year they make a new ring of wood, narrower and narrower as they grow older. Through the younger rings the crude sap goes up to the leaves, and the food-sap comes down to feed the parts of the tree. Buds are formed every spring on the stems at the foot of each leaf, and these buds are like new plants. They start with fresh strength, making new food for the tree, which carries them up on its trunk and branches into the light and air.

The heart-wood of the tree is really dead, and sometimes decays away while the outer part of the tree is still flourishing. But many of the rings of wood far inside the trunk still want food, and if you look at a felled tree you can see how they get it. Besides the rings, you will see some lines (*m*), like the spokes of a wheel, starting from the centre of the trunk and spreading out to the bark. These lines are made of pith, like that we saw in the middle of the young seedling oak. Until they are squeezed away the sap passes along them all through the tree.

There are some trees, such as the palms, which you see in hot-houses, which do not grow in rings. But these are not English, and do not concern us here.

Get several pieces of tree-branches and try to see the bark, the inner bark, the rings of wood and the heart-wood—Lilac,

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Lime, and Elder show the parts well. Oak and Pine show heart-wood best.

CHAPTER III

HOW A TREE GROWS— THE HORSE-CHESTNUT

WHEN a young tree has made plenty of wood and branches, it begins to use some of its buds for making flowers. These buds grow in the same places as leaf-buds. In some trees they grow where the leaf joins the stem. In others they grow at the tips of the twigs. They are generally rounder and less pointed than the leaf-buds.

The flowers of the oak are very small, so you had better look out for a horse-chestnut tree and gather a bough for this lesson. You will find buds on a horse-chestnut tree almost any time in the year, except when it is in full leaf, and then they will be very small.

The best time to look is just at the end of the winter, when the tree is bare. First notice the smaller buds, which grow two and two opposite each other along the twig. You will see below each bud a scar marking the place on which the leaf grew last year. This scar is shaped like a horseshoe, and has several black spots on it arranged like the nails. These spots show

TREES AND SHRUBS

where the bundles of tubes were, which carried the sap into the leaf.

Now pick one of the buds to pieces. They are small, and you will not find it very easy, but you can take off the brown sticky scales, and you will find inside, first some soft gummy down, and then the young green leaves, tightly folded together, with a green growing tip between them.

So if you had left that bud, and it could get food enough, it would have grown into a small branch in the spring, with leaves on it. But it is very seldom that *all* the buds on a branch grow. The stronger ones take the food, and the weaker ones either die or wait till next year.

Now look at the buds on the tips of the branches. They are very much larger than those growing on the sides, and you can examine them easily. When you have taken away from twelve to seventeen sticky scales, you will come to the same kind of soft white gummy down which you found in the leaf-buds, making a warm bed for the tender growing parts inside.

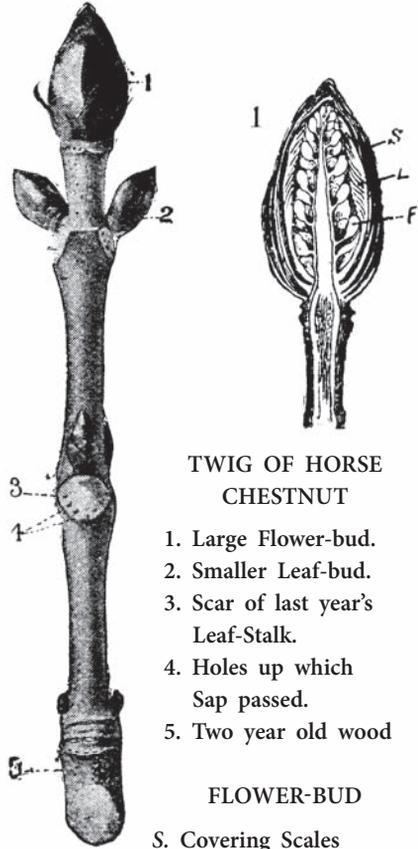
But this bud is not all leaves like the smaller one. It has four small bright green leaves, and wrapped up inside them is a tiny spike covered with little knobs (*F*).

You cannot examine the flowers on this spike without a microscope. But if you wait and watch till

HOW A TREE GROWS — THE HORSE CHESTNUT

May, you will see others like it gradually opening out into a lovely branch of flowers, and I think you will like them all the better for knowing how the tree prepared them last autumn, when it was covered with leaves, and wrapped them up warm all the winter in sticky buds.

And while you are waiting for the flowers, look at the tree itself. The trunk is smooth and round. The branches begin to grow out of it about ten feet from the ground. They grow two and two opposite to each other like the leaves, except where a bud has failed. The lower branches, which of course are the oldest, stretch out farthest, so that the tree rounds off very gracefully up to the top.



TWIG OF HORSE CHESTNUT

- 1. Large Flower-bud.
- 2. Smaller Leaf-bud.
- 3. Scar of last year's Leaf-Stalk.
- 4. Holes up which Sap passed.
- 5. Two year old wood

FLOWER-BUD

- S. Covering Scales
- L. Folded Leaves
- F. Flowers not yet opened

Then, as April comes, the brown scales fall from the leaf-buds, and the tree is covered with bright green

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downy leaves. They are each cut into seven leaflets, which hang down from the tip of the leaf-stalk like a half-opened umbrella. Little by little, as they grow stronger, they rise up into a broad leaf with seven fingers. It is while they are doing this that the flower-buds throw off their scales, the four green leaves open out, and the flower spike begins to hang out its snow-white flowers, streaked with pink and yellow (opposite).

The flowers nearest to the branch open first and grow strong. They are perfect flowers, with five green sepals and five beautiful crimped petals, and have both stamens and seed-box inside. These will form the chestnuts which ripen in the autumn. The flowers nearer to the tip of the spike have only stamens inside the petals. They wither away as soon as they have shed their pollen-dust.

If you can get an old flower spike when the flowers are withered, and cut the seed-box of a flower across, you will see that it has three divisions with two little seeds in each. But when you pick up the prickly fruit in the autumn, though it burst into three parts, there are generally only two horse-chestnuts inside, with another very tiny one. The two big seeds have starved out the other four little ones and grown big and strong. If the chestnuts are brown and shiny, they are ripe, and will grow if you sow them.

Though the horse-chestnut is very beautiful in the summer, its leaves turn yellow very early and fall in



HORSE-CHESTNUT FLOWER AND FRUIT

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August, and then you can see the buds already formed for next year. All boys know that horse-chestnuts are bitter and not good eating. The sweet chestnuts, which we roast, come from quite a different tree, and are not seeds, but fruits.

Bring a branch of horse-chestnut and examine the buds. Find a flower spike in May; look at the ovary in June, and the fruit in September.