VARIOUS

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FORESTS

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FORESTS have always been admired, and in ancient times they were often considered sacred, the special dwelling-places of gods and various strange beings. We can easily understand how forests thus affected men. There is a solemnity about them, a quiet grandeur, which is very impressive, and the rustling of their branches and leaves has that mysterious sound which caused the ancients to people them with spirits. We still recognize the feeling of awe that comes in the presence of forests, although we have long since ceased to explain it by peopling them with spirits.

Once forests covered all parts of the earth where plants

could grow well, and no country had greater forests than North America. When America was discovered, there was a huge, unbroken forest from the Atlantic west to the prairies. Now much of this has been cut away, and we see only small patches of it. Men must use the forest, and still they must save it, and they are now trying to find out how they may do both.

Forests are sometimes almost entirely made up of one kind of tree, and then they are called "pure forests." Pine and beech forests are examples of this kind. More common with us, however, are the "mixed forests," made up of many kinds of trees, and nowhere in the world are there such mixed forests as in our Middle States, where beech, oak, hickory, maple, elm, poplar, gum, walnut, sycamore, and many others all grow together.

Probably the densest forests in the world are those in the Amazon region of South America. So dense are they that hardly a ray of light ever sifts through the dense foliage, and even at noon there is only a dim twilight beneath the trees. The tallest forests are the Eucalyptus forests of Australia, where the trees rise with slender trunks to the height of four or five hundred feet. But the largest trees in the world, when we consider both height and diameter, are the giant "redwoods" (Sequoias) of the Pacific coast. All concede, however, that the most extensive, the most varied, and the most beautiful forests of the world are those of the Atlantic and Middle States.

Perhaps it is well to understand how a tree lives, that we

may know better what a forest means. The great roots spread through the soil, sometimes not far from the surface, at other times penetrating deeply. The young root tips are very sensitive to the presence of moisture, and turn towards it, no matter in what direction it may carry them. In penetrating the soil the sensitive root tips are turned in every direction by various influences of this kind, and as a result, when the root system becomes old, it looks like an inextricable tangle. All this tangle, however, but represents the many paths that the root tips followed in their search for the things which the soil contains.

Roots are doing two things for the tree: They anchor it firmly in the soil, and also absorb material that is to help in the manufacture of food. It is the older roots that have long since stopped absorbing that are the chief anchors. How firm this anchorage must be we can, perhaps, imagine when we think of the strain produced by a great crown of leaves swaying back and forth in the wind. It is only a cyclone that seems to be able to overthrow a sound tree, and then it more commonly breaks its trunk than uproots it.

The very important work of absorbing is given over to the very young roots; in fact, chiefly to those of this year, for new rootlets must be put out each year. These roots can only absorb water, so that if they are to get anything from the soil it must be something that water will dissolve. In this way the water is used as the carrier of soil-material into the root. Just how this water carrying soil-material gets into the root is not easy to explain, for

the root has no holes to let it in, and it must pass through living walls. That it does enter, however, every one knows. It is evident, therefore, that the root is supplying to the tree two kinds of raw material for food manufacture obtained from the soil, namely, water and soil-material dissolved in it.

But the tree does not obtain all its raw material from the soil. A very important material is taken from the air, the material commonly called "carbonic acid gas," the same material that we breathe out so abundantly from our lungs as one of our body wastes. This important material is taken out of the air into the plant chiefly by means of the leaves. Spread out as they are in the air, the leaves are in the most favorable position for doing this work.

But where and how are these three kinds of raw material manufactured into plant food? The leaves are specially constructed to be the chief seat of this food manufacture. The carbon gas is received directly into these manufactories from the air, but the water and the soil-material are down in the roots, and it is necessary for them to be carried to the leaves. As a consequence, a "current" of water containing soil-material ascends from the roots, through the stem, and is distributed through the branches to the leaves. This movement is generally known as the "ascent of sap." The path of this movement in the stem is through what is known as the "sap wood," and it is this very fact which gives to this region of the wood its peculiar character. Just how the sap ascends through the stem and reaches

the leaves, no one knows. All of our explanations have proved unsatisfactory, and only those who are not fully acquainted with the facts claim to be able to explain it.

When the sap reaches the leaves, the water is no longer needed as a carrier of soil-material. Some of it is needed in the manufacture of food, but by far the greater part of it escapes from the leaves into the air by a process which may be called "plant evaporation." The amount of water thus brought from the soil and poured out into the air by active plants is very great; and when we consider a forest at work, we can hardly compute the vast amount of moisture which it is constantly contributing to the air during the growing season.

The three kinds of raw material thus brought together chiefly in the leaves are there manufactured into plant food. On account of this work the leaves have often been spoken of as the "stomachs" of the plant. This is a very incorrect and misleading illustration, for the work referred to is not digestion such as a stomach is concerned with, and, in fact, it is a process entirely unknown in animals, and found only in green plants. It is a wonderful process, which we do not at all understand, but it consists in taking this dead raw material from soil and air and manufacturing out of it living material. Not only does the food of the plant, and hence its life, depend upon this process, but all the life of the world, as we understand it, depends upon it. We know at least two prominent conditions of this process, for it seems evident that it cannot take place without light and the

peculiar green substance which gives the characteristic color to leaves. With the help of light and this green coloring substance, known as "chlorophyll," the living substance in the leaves is able to do this marvelous work.

The food thus manufactured is distributed throughout the tree, either to be used wherever growth is going on, or to be stored up. While we may say that there is an "ascending current" of sap through the sap wood, it is an error to say that there is a "descending current." The movement of prepared food has no definite channel, but it is drawn in every direction wherever needed.

If we now consider the parts of a tree all together, we may be able to get some notion of the meaning of their positions. The roots must be related to the soil to secure anchorage and raw material for food manufacture. The leaves must be related to the air and light to secure more raw material and help in doing their important work of food manufacture. The stem is simply to carry the leaves well up into the air and sunshine, and has no meaning except as it is related to the work of the leaves. In thus widely separating the roots and the leaves, the stem must act as a channel of communication between them.

In the tree trunks with which we are familiar, everyone has observed the concentric rings of wood that appear in a cross-section. These are usually spoken of as "annual rings," with the idea that one ring is made each year. In consequence of this it is the habit to estimate the age of a tree by counting these

rings. Not infrequently it happens, however, that more than one ring may be made in a year, as a ring represents a single season of growth, and there may be more than one season of growth during a single year. It is much better to call them "growth rings," and to recognize the fact that by counting them we may be overestimating the age of a tree.

One of the most noticeable things about the principal trees of our temperate climate is that they "shed" their leaves every year, being covered with foliage during the growing season and bare during the winter. This is known as the "deciduous" habit, and such trees are called deciduous trees, in distinction from "evergreen" trees. This is really a habit, brought about by the conditions in which trees of temperate climates must live. The leaves of such trees are broad and thin, fitted for very active work. When the winter comes, they would be entirely unable to endure it. The tree might protect them by giving them narrow forms and thick walls (as in pines), but it would be at the expense of activity during the growing season. It is more economical for the tree to make an entirely new set of leaves each year than to protect the old ones.

Perhaps the most noticeable feature in connection with the fall of the leaves is that so many of them take on a rich coloration. Our mixed American forest is the most brilliantly colored autumnal forest in the world, and there can be no landscapes richer in color than those which include such a forest. While all this should appeal to our sense of the beautiful, it

should raise the question as to what it means in the life of the trees. We are not at all sure that we know, for we cannot as yet explain the conditions which cause the colors to be produced. We observe that they occur towards the end of the activity of the leaf, but that they are necessarily associated with cold, or drought, or certain outside conditions, is not at all clear. The colors are various shades of red and yellow, sometimes pure, sometimes mixed. It has been recently suggested that the red color is to serve as a protection. It is known that before the fall of the leaf the living substances are gradually withdrawn into the permanent parts of the tree, and that when these living parts cease to work they are peculiarly helpless. At this unprotected period the red appears, and this color absorbs enough heat from the light to raise the temperature, and so the needed protection against chill is afforded. This seems reasonable, but the whole subject of the meaning of plant colors is very obscure.

Gen. Robert E. Lee was a great lover of forest trees. He owned a large and beautiful forest in northern Virginia at the time of the War of the Rebellion. While the army of Virginia was encamped near Fredericksburg, he was gazing at the great forest trees that beautified a homestead near by, the property of his companion. This companion quotes him as saying on this occasion: "There is nothing in vegetable nature so grand as a tree. Grappling with its roots the granite foundations of the everlasting hills, it reaches its sturdy and gnarled trunk on high, spreads its branches to the heavens, casts its shadow on the sward; and the birds build their

nests and sing amid its umbrageous branches."

THE BRAVE OLD OAK

A song to the oak, the brave old oak,
Who hath ruled in the greenwood long;
Here's health and renown to his broad green crown,
And his fifty arms so strong.
There's fear in his frown when the sun goes down,
And the fire in the west fades out;
And he showeth his might, on a wild midnight,
When the storms through his branches shout.

Then here's to the oak, the brave old oak,
Who stands in his pride alone;
And still flourish he, a hale, green tree,
When a hundred years are gone.

In the days of old, when the spring with cold
Had brightened his branches gray,
Through the grass at his feet crept maidens sweet
To gather the dew of May;
And on that day, to the rebeck gay
They frolicked with lovesome swains;
They are gone, they are dead, in the churchyard laid,
But the tree, it still remains.

Then here's to the oak, the brave old oak,

Who stands in his pride alone;
And still flourish he, a hale old tree,
When a hundred years are gone.

He saw the rare times when the Christmas chimes
Were a merry sound to hear,
When the squire's wide hall and the cottage small
Were filled with good English cheer.
Now gold hath the sway we all obey,
And a ruthless king is he;
But he never shall send our ancient friend
To be tossed on the stormy sea.

Then here's to the oak, the brave old oak,
Who stands in his pride alone;
And still flourish he, a hale, green tree,
When a hundred years are gone.

– Henry Fothergill Chorley.

"CHEEPER," A SPARROW BABY

BY ANNE W. JACKSON

ONE day in May, as I was hurrying along the street, my steps were arrested by the distressed chirping of a sparrow on the opposite sidewalk. Thinking that probably a young sparrow had fallen from the nest, I picked my way across the muddy road to the other side to see what I could do.

The poor little sparrow-mother was wildly hopping about and chirping in sore distress. And what a pitiful sight greeted my eyes! Upon the wet grass, under the very jaws of an evil-looking little black-and-tan dog, was a poor, draggled, shivering baby sparrow.

At sight of me the dog coolly picked up the baby and trotted off. I followed and he soon dropped it; but I couldn't succeed in driving him away. He still remained in sight, bold and impudent.

I was in a sad dilemma. Of the two evils which confronted me, or rather the baby, which would prove the less?

The trees all about the place were tall ones, with no low branches. There was no hope of returning the baby to its nest. It was too weak from cold and fright, as well as too young, to fly. If I left it the dog would certainly return and devour it before its

mother's eyes.

On the other hand, if I took it home with me it would probably die under my ignorant care. However, I decided on the latter course, so clasping it close in my hand, continued on my way.

Those who have a continual grudge against the English sparrow will say, "Why all this fuss over a miserable little nuisance of a sparrow?" and think the wisest thing would have been to leave it to its fate. But the superfluity of the English sparrow is not the question in a case like this. When something weak and helpless is thrown across our path, it simply remains for us to help and save it, if it is in our power.

On the way home I pondered a good deal over the question of how I should care for it and feed it, and what I could find to keep it in, as I had no bird-cage.

When I got Master Sparrow home, and had thoroughly warmed him and dried his little feathers (they were very few!) I put him into the best substitute for a bird-cage that I could find, and that was a large wire rat-trap!

The next question was, what to feed him. As I had seen sparrows picking at the cornmeal which we mixed and gave to the little chickens, I ventured to put some of it into his cage.

I watched him a good deal, that day and didn't *see* him eat a morsel. But as he seemed stronger and more lively the next day, I concluded he was bashful and only ate when I wasn't looking.

Soon, however, he grew less afraid of me and would hop about and peck at his food when I was near. I began to vary his diet, too,

and gave him what green slugs I could find on the rosebushes, as well as minced earthworms. He ate the slugs eagerly and seemed to enjoy tugging at wriggling bits of earthworm.

He also began to develop quite a voice and "cheeped" so loudly that I named him "Cheeper."

I grew very fond of him and watched him grow and feather out with great pride and interest. As he became stronger he grew more eager to get out of his cage. It quite went to my heart to see him beating against, the wires, and vainly striving for freedom. But I feared he couldn't take care of himself; and also that the other birds might not receive him well.

So I kept him seven days. I put his cage in the window several times where he could look out on the world and become acquainted with the colony of sparrows which inhabits the Virginia creeper covering the north side of our house. He would "cheep" very loudly on these occasions and try harder than ever to get out. His presence in the window made a great commotion among the other sparrows, who chirped excitedly and flew about, taking long looks at him. Two of them went so far as to alight on his cage.

On the seventh day, at noon, I took his cage to the window and set him free. He flew the length of the house and settled on a rosebush at the end of the porch, where he sat for some time, peering about, with his little head comically hoisting this side and that. Presently, when I came to the window to see if he were still there, I found he had flown away; and though I thought I could

distinguish his particular "cheep" several times afterwards, I saw him no more that day. Nor did I expect to see him again.

I missed him a great deal and was surprised to find how fond of him I had grown. Imagine my surprise and delight when I went out next morning to feed the chickens to find little "Cheeper" there before me! He flew onto the fence when he saw me, but soon flew down again, and hopped about among the little chicks quite fearlessly. I was afraid the big chickens would step on him; and, sure enough, the Bantam rooster *did* walk right over him, but he just squawked and hopped away without any apparent resentment.

The next morning he was there again, when I went out. This time he followed a hen about, hopping along with her little chicks as though he thought himself one of them. He was such a fluffy little fellow, and he did look so tiny and cunning!

Poor little motherless baby, trying to find a mother in a big hen! That was the last time I saw him.

Only a despised little English sparrow! Yet, little "Cheeper," you had your mission in life. You made the heart of one bird-lover more tender by your helplessness, and your memory is dear to her.

THE HERMIT THRUSH

NELLY HART WOODWORTH

Does the thrush drink wild honey? a nectar distilled
From the flowers of the field, that his message is filled
With such sweetness? O'er the twilight 'tis ringing —
June's divinest refrain, 'tis a soul that is singing,
Oh, so trustfully sweet, rapture blended with pain,
Rings the silver bell softly, I hear it again,
And the wood is enchanted, uncertain it seems,
As some moment of waking, the dreams, oh the dreams!

Does he bathe evermore in the miracle springs,
That his wings and his heart are in rhythm when he sings?
Tears moisten the harpstrings, they quiver with pain,
Then the triumph, the peace but the finest souls gain —
Earth's losses, its tears through the notes sweep along,
The longings of earth find a voice in the song,
Till outechoed by angels they find a release,
To be silenced henceforth, merged in infinite peace.

Will the spirit bird sing through the ages to come,
Or the soul take its flight and, still singing, go home,
And the world weep aghast when, the music withdrawn,

The lark still a wing tells the rapture of dawn?

THE GRAND CAÑON OF THE COLORADO

[From Major J. W. Powell's Report of the Exploration of the Cañons of the Colorado – 1869.]

"FOR two years previous to the exploration, I had been making some geological studies among the heads of the cañons leading to the Colorado, and a desire to explore the Grand Cañon itself grew upon me. Early in the spring of 1869 a small party was organized for this purpose. Boats were built in Chicago, and transported by rail to the point where the Union Pacific Railroad crosses the Green River. With these we were to descend the Green into the Colorado, and the Colorado down to the foot of the Grand Cañon."

From the record of May 24, 1869, we quote the following:

"The good people of Green River City turn out to see us start – a party of ten men. We raise our little flag, push the boats from shore, and the swift current carries us down."

"Our boats are four in number. Three are built of oak, staunch and firm."

"We take with us rations deemed sufficient to last ten months, abundant supplies of clothing, also a large quantity of

ammunition and two or three dozen traps."

On the 26th they go into camp at the foot of the Uintah Mountains, at the head of Flaming Gorge Cañon, the first to be explored.

We quote again: "The river is running to the south; the mountains have an easterly and westerly trend directly athwart its course, yet it glides on in a quiet way as if it thought a mountain range no formidable obstruction to its course. It enters the range by a flaring, brilliant-red gorge, that may be seen from the north a score of miles away."

"You must not think of a mountain range as a line of peaks standing on a plain, but as a broad platform many miles wide, from which mountains have been carved by the waters. You must conceive, too, that this plateau is cut by gulches and cañons in many directions, and that beautiful valleys are scattered about at different altitudes. The first series of cañons we are about to explore constitute a river channel through such a range of mountains. The cañon is cut nearly half-way through the range, then turns to the east, and is cut along the central line, or axis, gradually crossing it to the south. Keeping this direction for more than fifty miles, it then turns abruptly to a southwest course, and goes diagonally through the southern slope of the range."

"May 30. – This morning we are ready to enter the mysterious cañon, and start with some anxiety. The old mountaineers tell us it cannot be run; the Indians say, 'Water heap catch 'em;' but all are eager for the trial, and off we go."

"Entering Flaming Gorge, we quickly run through it on a swift current, and emerge into a little park. Half a mile below, the river wheels sharply to the left, and we turn into another cañon cut into the mountain. We enter the narrow passage. On either side the walls rapidly increase in altitude. On the left are overhanging ledges and cliffs five hundred, a thousand, fifteen hundred feet high.

"On the right the rocks are broken and ragged, and the water fills the channel from cliff to cliff. Now the river turns abruptly around a point to the right, and the waters plunge swiftly down among great rocks; and here we have our first experience with cañon rapids. I stand up on the deck of my boat to seek a way among the wave-beaten rocks. All untried as we are with such waters, the moments are filled with intense anxiety. Soon our boats reach the swift current; a stroke or two, now on this side, now on that, and we thread the narrow passage with exhilarating velocity, mounting the high waves, whose foaming crests dash over us, and plunging into the troughs, until we reach the quiet water below; and then comes a feeling of great relief. Our first rapid run. Another mile and we come into the valley again.

"Let me explain this cañon. Where the river turns to the left above, it takes a course directly into the mountain, penetrating to its very heart, then wheels back upon itself, and runs into the valley from which it started, only half a mile below the point at which it entered; so the cañon is in the form of an elongated **U**, with the apex in the center of the mountain. We name it

Horseshoe Cañon.

"Last spring, I had a conversation with an old Indian named Pa-ri-ats, who told me about one of his tribe attempting to run this cañon. 'The rocks,' he said, holding his hands above his head, his arms vertical, looking between them to the heavens – 'the rocks h-e-a-p, h-e-a-p high; the water go h-oo-woogh, h-oo-woogh! water-pony (boat) h-e-a-p buck; water catch 'em; no see 'em Injun any more! no see 'em squaw any more! no see 'em pappoose any more!'

"June 7. – On a rock we find a pool of clear, cold water, caught from yesterday evening's shower. After a good drink we walk to the brink of the cañon, and look down to the water below. I can do this now, but it has taken several years of mountain climbing to cool my nerves, so that I can sit, with my feet over the edge, and calmly look down a precipice two thousand feet. And yet I cannot look on and see another do the same. I must either bid him come away or turn my head.

"This evening, as I write, the sun is going down, and the shadows are settling in the cañon. The vermilion gleams and roseate hues, blending with the green and gray tints, are slowly changing to somber brown above, and black shadows are creeping over them below; and now it is a dark portal to a region of gloom – the gateway through which we are to enter on our voyage of exploration to-morrow."

The 9th of June brought disaster to a boat containing three of the men, who were carried down the rapids, but all were rescued.

They pass the mouths of the Uintah and the White Rivers, with constantly changing scenes, making a tortuous journey through many dangerous rapids, much of the time between high, perpendicular walls.

On the 15th they pass around a great bend, five miles in length, and come back to a point one-quarter of a mile from where they started. Then they sweep around another great bend to the left, making a circuit of nine miles, and come back to one-third of a mile from where the bend started. The figure 8 properly describes the fourteen miles' journey. July 17 they arrive at the junction of the Grand and Green rivers, having traversed about eight hundred and four miles.

On the morning of July 19, the Major and a companion start to climb the left wall below the junction of the Grand and Green Rivers. They reach the summit of the rocks. The view is thus described: "And what a world of grandeur is spread before us! Below, us is the cañon, through which the Colorado runs. We can trace its course for miles, as at points we catch glimpses of the river. From the northwest comes the Green, in a narrow, winding gorge. From the northeast comes the Grand, through a cañon that seems bottomless, from where we stand. Away to the west are lines of cliff and ledges of rock – not such ledges as you may have seen, where the quarry-man splits his blocks, but ledges from which the gods might quarry mountains, that, rolled on the plain below, would stand a lofty range; and not such cliffs as you may have seen, where the swallow builds his nest,

but cliffs where the soaring eagle is lost to view ere he reaches the summit. Between us and the distant cliffs are the strangely carved and pinnacled rocks of the *Toom pin wu-near Tu-weap*. On the summit of the opposite wall of the cañon are rock forms that we do not understand. Away to the east a group of eruptive mountains are seen – the Sierra La Sal. Their slopes are covered with pines, and deep gulches are flanked with great crags, and snow fields are seen near the summits. So the mountains are in uniform – green, gray, and silver. Wherever we look there is but a wilderness of rocks; deep gorges, where the rivers are lost below cliffs and towers and pinnacles; and ten thousand strangely carved forms in every direction, and beyond them mountains blending with the clouds."

"Traveling as fast as I can run, I soon reach the foot of the stream, for the rain did not reach the lower end of the cañon, and the water is running down a bed of dry sand; and, although it comes in waves several feet high and fifteen or twenty feet in width, the sands soak it up, and it is lost. But wave follows wave, and rolls along, and is swallowed up; and still the floods come on from above. I find that I can travel faster than the stream; so I hasten to camp and tell the men there is a river coming down the cañon."

Конец ознакомительного фрагмента.