

tubers and rhizomes, or root-stocks, such as those of the Primrose and Cuckoo-pint.

We have seen that the uses of stems are—

(a) To conduct raw food materials to the leaves;
(b) To spread out those leaves to the air and sunlight; but we must not forget that

(c) They also conduct the foods elaborated in the leaves to the storage regions. In other words, stems connect the green leaves, which are the food factories of the plant, with the roots, which are the suppliers or raw materials in the form of water and minerals.

The wind exerts such force on the leaf surface of a tree that elasticity is demanded in the sturdiest of trunks. As the stem bends, the fibres on one side are lengthened and on the other compressed, so that the trunk can regain its former position. Much more is going on in the stem than we can mention. Little as we understand of it, we can yet see that the daily work of the stem entails wonderful complex chemical and mechanical processes.

The circulatory system in a plant is very interesting. It spreads from the roots through trunk and branch into every leaf. The channels consist of masses of tubes sometimes called vascular bundles; they are really old cells whose dead woody substance is strengthened and lengthened to form conduits. These bundles vary in number and position according to the kind of plant. They can be plainly seen in a section of many stems, but the best way to show them is to place a freshly-cut stem—of the Deadnettle, for instance—in a glass of water colored with red ink. Slit the stem when it has been left a day in the solution. The course of the channels is shown by their red color. Besides the vessels there are, tough woody fibres, which, together with the old, dry vessels form the supporting or mechanical tissue of the stem.

When we examine a tree we find that the real living, growing part lies just beneath the bark. The inner part is the wood which mainly forms a support. When a tree is felled and “bleeds” the centre or “heart-wood” is dry enough. The moisture is in the outer layers of the wood—the “sap-wood”; and in the soft layer of cells between the sap-wood and the bark.

STEMS

“Enforst to seek some covert nigh at hand,
A shady grove not far away they spide,
That promise ayde the tempest to withstand,
Whose lofty trees yclad with summer's pride,
Did spread so broad that the heavens light did hide,
Not perceivable with power of any starre.

“Much can they prayse, the trees so straight and hy,
The sayling Pine, the Cedar proud and tall,
The vine-prop Elme, the Poplar neuer dry.
The builder Oake, sole king of forests all,
The Aspine good for staues, the Cypress funerall.

“The Laurel, meed of mightie conquerours,
And poets Sage; the Firre that weepeth still;
The Willow worne of forlorne paramours,
The Eugh, obedient to the bender's will,
The Birch for shafts; the Sallow for the mill.
The Mirrhe sweet-bleeding in the bitter wound;
The war-like Beech; the Ash for nothing ill;
The fruitful Olive; and the Platane round;
The caruer Holme; the Maple seldom sound.”

Spencer.

“Honeysuckle loved to crawl
Up the low crag and ruined wall.”—*Scott.*
“The harebell trembled on its stem
Down where the washing waters gleam.”

Julia C. R. Dorr.

“Across the porch
Thick jasmine twined.”—*Coleridge.*

* * * * *

“The plant grew thick and fresh, yet no one knew
What plant it was; its stem and tendrils seemed
Like emerald snakes, mottled and diamonded
With azure mail and streaks of woven silver....

It grew;

And went out of the lattice which I left
Half open for it, trailing its quaint spires
Along the garden and across the lawn,
And down the slope of moss and through the tufts
Of wild flower roots, and stumps of trees o'ergrown
With simple lichens and old hoary stones.”—*Shelley.*

“The Ivy and the wild vine interknit
The volumes of their many twining stems.”—*Shelley.*

“I see a chaos of green leaves and fruit
Built round dark caverns, even to the root
Of the living stems that feed them.”—*Shelley.*

“A leaning and upbearing parasite
Clothing the stem, which else had fallen quite
With clustered flower-bells and ambrosial orbs
Of rich fruit bunches leaning on each other.”

— *Tennyson.*

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