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FIRST STEPS
IN
GENERAL KNOWLEDGE

VEGETABLE KINGDOM.

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PRESENTED BY
PROF. CHARLES A. KOFOID AND
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FIRST STEPS
IN
GENERAL KNOWLEDGE.

BY MRS. CHARLES TOMLINSON.

PART IV.
THE VEGETABLE KINGDOM.

**PUBLISHED UNDER THE DIRECTION OF
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FIRST STEPS IN GENERAL KNOWLEDGE.

The Vegetable Kingdom.

CONVERSATION I.

SEA-WEEDS—MUSHROOMS—LICHENS.

It was a lovely April morning; the sun shone brightly after heavy showers; the birds sang joyously among the trees, and scattered rain-drops as they flitted from bough to bough: every plant was laden with moisture, and the thickly-blossomed cherry on the garden-wall had showered down its beautiful petals under the influence of the driving rain. The gravel-path afforded the only dry walking ground, and here might be seen three young folks, newly escaped from their morn-

ing studies, and now driving the hoop, or tossing the ball with much glee.

An hour quickly passed away in this manner; but when their father came out to take his morning walk, they hastily laid aside their games, and begged that they might accompany him.

"The roads are too wet for you at present," said he, "but as you seem tired of play, I will spend a few minutes with you before I take my walk, and we will see if the garden affords an example of the lowest order of plants; for I have not forgotten my promise to give you the same kind of sketch of the Vegetable Kingdom which I did last autumn of the Animal Kingdom."

"Oh, thank you—thank you, papa," said all three, and Henry added "that he thought it must be the very best time to learn about plants, now they were all springing up afresh, and now the crocuses and snowdrops and violets were so beautiful." He was surprised, however, to see that his father passed by all the flower-beds, and went to a part of the garden where nothing seemed to be growing. There, under the shelter of a wall, and where the path was very damp, he began to take up a portion of the green coating which covered it.

"What are you going to do with that green stuff, papa?" said Robert; "there is plenty of it on the glass of the hot-house; and there was a great deal on the rocks last summer, close by the sea."

"I am going to show it to you under the microscope, as an example of the lowest stage of vegetable life. Some of the plants of this order come so near the lowest tribes of animals, that even the best naturalists find it difficult to decide between them."

"Why do they not watch them very closely, to see whether they move?" asked Mary.

"Even that will not decide the matter, for some of these plants move about in water by means of little *cilia*, or hairs, exactly like certain animals."

"That is very odd," said Henry; "how can people possibly find out which is which?"

"The only certain distinction which I have heard of is one that can only be proved by scientific persons; it is the presence of *starch*, which is found in many of these tribes, and which is known to be a vegetable and not an animal production. Still, there are mysteries in this subject known only to that Infinite Being who planned and executed the wonderful scheme of creation."

"I never see any of that green slime," said Mary, "except in very wet places."

"And for a good reason," replied her father. "All the plants of this lowest race are inhabitants of the water, both fresh and salt; and when a path becomes soaked with rain, as this is, and the water settles for some time on the surface, then do these minute plants spring up, giving a greenish tinge to the ground."

"And what is the name of these water plants?" asked Henry.

"The great tribe to which they belong is that of the ALGÆ."

"Algæ," said Mary, "is the word which mamma wrote in our book of dried sea-weed, and I thought it meant sea-plants."

"So it does; but it also includes their fresh-water relations, of which very many families are of this slimy character, and inhabit still waters and oozy places in the northern parts of the world."

Henry took up a bit of the damp earth that was covered with this green substance, and he found that it fell to pieces very easily, and that there were no roots to the tiny plants to bind it

together. His father told him that this tribe of plants has been called BRITTLEWORTS, on account of their so easily breaking into fragments.

“There is another order of algæ,” he continued, “where many of the plants are red, violet, or olive, instead of green, although they are found in fresh as well as in salt water. They are called *confervæ*, and some are remarkable for the colour they give to the water. The Red Sea appears to have derived its name from the multitude of minute *confervæ* often seen floating in its waters. A French writer* tells us that as he entered this sea by the straits of Babelmandel, in July, 1843, he was astonished to find the waters stained red, as far as the eye could reach. Collecting some of the water, he found it to be covered with a thin layer of a brickdust colour. This layer changed in the course of the day to a deep-violet colour, but the water itself was tinged with a beautiful rose-pink.”

“I am glad they found out what it was,” said Henry, “for it must have looked very much like a sea of blood.”

“Other families of these plants make the water green, or brown, or violet,” said his father; “so

* Dupont.

that we need not be surprised at any wonderful stories we read about the colour of the sea. It also sometimes happens that when meadows are long under water, they are covered to the depth of an inch with an entangled layer of similar plants, almost like woollen cloth, and which is commonly called *water-flannel*."

"Are these plants of any use?" asked Robert.

"I do not know of any use in the smaller species; but some of the larger *confervæ*, called *Laver*, are eaten by many persons, either stewed or pickled. Yet we may be quite sure that it is for some wise purpose that God has filled the seas and rivers with such multitudes of these plants. Another order of *algæ* contains the different kinds of *FUCUS*, or *Sea-wrack*, some of which are used as food by the poorer classes of Ireland, Scotland, Iceland, &c. Some are also employed as manure, and are of importance in the manufacture of glass and of soap, on account of the quantity of impure soda (called *kelp*) which is obtained from them. Those large, dark-looking weeds, with air-bladders in their leaves, which you called your *weather-glass*, were some of the common kinds of *sea-wrack*."

“Those were the weeds you said were useful in medicine, papa.”

Fucus Canaliculatus.

“Yes; they contain iodine, which is particu-

larly useful in those swellings of the throat called *goître*. In some parts of South America where this disease is common, the inhabitants chew the stems of these weeds, and call them by a name which means 'goître-stick.'"

"Some of the stems are very thick," said Mary, "and one very tough sort, I remember, you called *sea-girdles*."

"Did I tell you of the odd use these girdles are sometimes put to? They are cut in pieces about four inches long; and while they are fresh, the hilt of a pruning-knife is stuck into each piece. As the stem dries, it clings closely to the hilt and forms a good and strong handle, and from its withered and brown appearance it looks very much like buck's-horn, especially when tipped with metal. Thus a number of knives can be easily and cheaply finished off."

The children thought the sea-wracks very useful weeds, especially when they found, that if fuel is scarce, they can be dried and used for that purpose; that the young shoots are eaten in Edinburgh, as "tangles," and that cattle will thrive on the plants when boiled. Robert also remembered that it was from the air-bladders of one of

these weeds* that he made such famous whistles when he was by the sea-side.

“What are the air-bladders for?” asked Mary.

“No doubt to support the weeds on the water; for some of them are of enormous size and length. Dr. Hooker saw them high up in the South Seas, growing in large patches wherever the water was free of icebergs; the plants were several hundred feet long, and could scarcely have been supported without air-bladders. Around the Falkland Islands they were also very abundant, and sometimes clasped the rocks, and became tree-like in their form, the stems being thicker than a man’s thigh, and the long leaves drooping like the branches of a willow. Dr. Hooker tells us that no one who has not actually seen it can form an idea of the amount of life which is nourished and housed by one of these tree sea-weeds. Various kinds of worms, small sponges, corals, crabs, eggs of fish, and myriads of shells, with their inhabitants, find a home there, while the lesser sea-weeds cling to it as moss clings to a large tree.”

“How very different the dark-looking, leathery

* *Fucus nodosus*.

sea-wracks are from my beautiful pink sea-weeds!" said Mary.

"Your pretty specimens," said her father, "belong to a tribe called ROSE-TANGLES, which are most of them rose-coloured or purple. Some of the ocean caves are quite lined with dark-red weeds of this description. Rose-tangles are not only pretty, but useful; a nourishing jelly is made

DULSE.

from one of them, improperly called Carrageen moss; a substitute for tobacco is found in another, called *dulse*, which is washed in fresh water, dried

in the sun, and then rolled up for use, by the Irish and Scotch. Dulse is also stewed with milk, or eaten raw with fish. That very bright-coloured

PINK SEA-WEED.

(*Plocamium coecineum*.)

weed, in your book is a great favourite everywhere, and may be easily known from other families in this tribe by the way in which the branches are divided. Here, also, we find the beautiful *corallines*, of which we have so many specimens on our shores. There is a small kind of rose-tangle, which is invaluable to the Chinese as a

glue and varnish. About 27,000 pounds weight of this plant are annually brought into Canton, and sold at sixpence or eighteen pence the pound.

CORALLINE.

With this they varnish the paper for their lanterns, and give the beautiful gloss to their silks; and it seems likewise to be the principal ingredient in a celebrated transparent composition which they spread out over slips of bamboo, and use instead of glass in windows, the bamboo slips being arranged in the manner of a frame.”

Mary was delighted to find that the beautiful rose-tangles served so many useful purposes in the world; and she was amused to hear that the eatable birds'-nests, which her brothers had so often laughed at the Chinese for being fond of, are supposed to be made of some of these weeds; so that, after all, in devouring the nests, the people are, perhaps, only eating a jelly, such as we get from the carrageen and other plants of this family. Her father told her that the remaining algæ which he had to mention were weeds of ill odour, living in stagnant water, either fresh or salt, and having their stems often coated over with carbonate of lime. They are upright tubes, with whorls of smaller tubes surrounding the stem, and are called *Charas*.

The children were much pleased with what they had heard of the great tribe of plants that inhabits the waters; and Mary thought it would be a wonderful sight if any one could look down into the deep deep sea, where so many beautiful things are growing.

"There are no storms there," she said, "for I have learned some pretty lines that tell me so.

“The water is calm and still below,
For the winds and waves are absent there,
And the sands are bright as the stars that glow
In the motionless fields of upper air ;
There, with its waving blade of green,
The sea-flag streams through the silent water,
And the crimson leaf of the dulse is seen
To blush like a banner bathed in slaughter.
There, with a slight and easy motion,
The fan-coral sweeps through the clear deep sea,
And the yellow and scarlet tufts of ocean
Are bending like corn on the upland lea.’”

During the foregoing conversation the party had approached the gate of the orchard, where, in summer, a few mushrooms occasionally sprang up. “In a few weeks,” said their father, “we shall have to set out for yonder pastures, on our mushroom expedition. After these rains, it is likely that they will be numerous ; for these plants, like the algæ, are very fond of water, though they do not live entirely in it.”

“We must be careful what we gather,” said Henry, “for some kinds are poisonous.”

“The FUNGUS tribe, which includes our common mushroom, is a very curious and wonderful race of vegetables,” said his father, “springing up with a rapidity unknown in other plants, and not un-

frequently growing many inches in the space of a night, especially after storms."

"The large *puff-ball* which we found in the meadow was a fungus," said Henry; "and so, I suppose, are all the plants we call *toad-stools*: and so are the beautiful orange-coloured velvety spots we sometimes find on old fences."

"Every kind of mouldiness, or mildew, wherever we may find it," added his father, "also proceeds from the growth of innumerable small fungi."

"Then the mould I saw in the cellar, and that on my cup of paste," said Henry, "must be of this kind."

"And that on mamma's preserves," said Mary, "and on the bread when it is very stale. I suppose we may make these plants grow when we like: it is only to keep our food a long time, and it will be covered with them. Do they grow from seed, or what brings them?"

"That is one of the mysteries we cannot penetrate," said her father. "We cannot tell how it is, that in the dark or in the light, in the open air or in the closet, these plants spring up. Whether their seeds are so light as to be carried about invisibly, and lodged in such various places, or

whether fungi are merely different states of decaying vegetable matter, it is quite impossible to say; but this we know, that in a single fungus, a botanist (M. Fries) reckoned ten millions of seeds, or sporules, as they are called; and these, which are carried about like thin smoke, may be conveyed by insects, elasticity, adhesion, or other causes, into remote places, and spring up when they find a substance suited to their growth."

"How could any one reckon ten millions?" asked Henry. "I have heard that it would take about a fortnight to count one million."

"In reckoning such minute substances, we do not, of course, count one by one throughout, but after finding out how many there are in a certain space, we multiply the others by them. Thus, if I wished to reckon the sweet peas your mamma is sowing in the garden, I would fill a small measure with the seed, and if I found that it contained two hundred seeds, I should afterwards know that every time I filled it there would be that number, or very nearly. Before we leave the fungi, I must tell you that they are far more numerous in many foreign countries than in our own. In Australia, for instance, they are much

used by the natives, and are also eagerly sought after by the curious pouched animals of that land."

Mary asked, if any besides the common mushroom were eaten in this country; and her father told her that two other families of fungi are much esteemed, namely, "the Morel" and "the Truffle;" the former growing up in beech woods, in a mushroom shape; the latter, an underground production, black and warty on the outside, but white within. Truffle hunters are assisted by dogs, whose keen scent enables them to find out the places where the fungus is growing.

The children were also informed that the "dry rot," which is often of serious consequence to the timbers of ships and buildings, is a fungus; also the blight in corn, and the diseases called "smut," "ergot," and "rust;" likewise a blighted appearance on the leaves of some plants, such as the dingy-red spots on the leaves of the pear-tree, which are found to be caused by a small fungus growing on the under side.

"How odd it is that one vegetable should grow upon another in that way!" said Robert.

"You have seen many examples of it in the LICHENS you are so fond of collecting," replied his

father; "these, as you know, are very common on trees as well as on buildings. They gain their nourishment from the atmosphere, and not from the material on which they grow; therefore they are not so injurious as the fungus, which is fed out of the very substance of what it grows upon."

"How delighted we were," said Mary, "when you first taught us to find lichens! We had no idea that the yellow and white patches on the bark of the elm-trees, and the brown and gray spots on the walls of our house, were all living vegetables. And then, what beautiful pale gray lichens we found on the church porch, and even on the tombstones! they were so flat and close to the stone that they looked like stains."

"Without lichens," said her father, "our landscapes would lose much of their picturesque beauty, and our ancient edifices much of their venerable character. It is remarkable in large and smoky cities, where lichens do not flourish, how much less interesting is the appearance of the old buildings. The harmonious colouring of these little plants is there greatly missed."

"Are lichens of any use, papa?" asked Robert.

"They are of great use in several ways. They

are the first plants to clothe the surface of bare rocks; and therefore they are the first vegetable substances on newly-formed islands in the midst of the ocean, thus preparing the way for higher orders of plants, and finally for the abode of man. Their domestic uses are of two kinds: some are nourishing and medicinal in their properties, and some are valuable in affording dyes. Several species of lichen form the food of Canadian hunters, and are called by them *Tripe de Roche* :* these supplied our Arctic travellers, Franklin, Richardson, and Back, with their only means of subsistence during a portion of the time spent in exploring the frozen regions of the north. A species called 'Iceland moss' † furnishes a nutritive jelly for invalids; another, known as 'Reindeer moss' ‡ is the winter food of the reindeer of the Laplanders. There is also a common lichen called 'Lungs of the Oak,' § which is used in Siberia for giving a bitter to beer, and in this country as a nourishing diet for invalids. Several others are said to possess medicinal qualities; and one, called by the Swedes *Ulfmossa*, || is believed by the people

* *Gyrophoras*. † *Cetraria islandica*. ‡ *Cenomyce rangiferina*.

§ *Sticta pulmonacea*.

|| *Evernia vulpina*.

to be poisonous to wolves. Chemists tell us that lichens contain several peculiar bitter principles

“LUNGS OF THE OAK” LICHEN.

and colouring matters; and many of the species are rich in a substance called usnine, or usnic acid, which is of a yellow colour, but changes by exposure to the air, and by its various combinations produces many of the beautiful colours observed in lichens.”

“And some of those are the colours used in dyeing, I suppose,” said Henry.

“The chief supply of dyeing-material is obtained from a white or grayish lichen, growing abun-

dantly in the Canary, Cape de Verd, and other islands, and scantily in Guernsey and the isle of Portland. It is the 'Orchella lichen,'* from which a colour is obtained which, when evaporated to powder, is the deep-red substance sold in our shops as *cudbear*. Prepared orchella is, however, usually known by the name of *archil*, and is of a rich crimson colour, bordering on violet. It is used more frequently to give a rich bloom to other colours than alone, and it is interesting to find that a similar practice was adopted in the time of Pliny, who, speaking of this moss as growing on the rocks of Candia and Crete, mentions that the dyers employed it to give the first tint or ground colour to stuffs which were intended to be of a costly purple. Several other lichens yield dyeing-material, but the Rocella is the most important. It is however fugitive and evanescent in its character, as may be seen by the changes in litmus paper, which is dyed with this substance."

"Why does Henry always look out for lichens that have little cups or shields upon them?" said Robert.

"Because these shields contain the spores, or

* *Rocella tinctoria*.

seeds, and the lichen is in perfection when so adorned. Some of these shields, as you remember, lie flat upon the lichen, others are elevated on little stalks. They are always best developed in places fully exposed to the light; hence it is of very little use to search for shield-bearing lichens in shady groves or in the dark clefts of rocks. You have proved how well lichens can be kept, without the trouble in drying which you have with other plants. Some of those in my cabinet were gathered twelve years ago, and are very little altered: and I have seen older collections in fine preservation."

CONVERSATION II.

MOSES AND FERNS.

MARY had been arranging a cushion of moss on a china dish, and sticking violets and primroses among its delicate fibres. This had a pretty effect, and her mamma praised her spring nosegay. "Will you tell us, papa," said the little girl, "something about these beautiful mosses, that are so bright and green long before the leaves of the trees are out?"

"MOSESSES," said her father, "are not so simple in their structure as lichens, and therefore come higher in the scale of vegetable life. There are plants nearly related to them, called Liverworts, which are of a somewhat fleshy substance, and grow only in very damp places. You remember finding a mass of green scales overlapping each other on the damp earth near the pond; that was liverwort, and it is also to be found on trees in shady and moist places. A very curious fact connected with liverworts is, that in the little case which contains the spores there is a spiral thread

lying among them, or sometimes two twisted together, and contained in a delicate transparent tube. These threads have a strong elastic force, and perhaps assist in dispersing the seed."

Henry asked why they were called liverworts, and was told that they were formerly used in liver complaints, and that one of them* is still thought to be of some value in cases of dropsy.

"Mosses," said his father, "perform a similar office to lichens in nature generally; preparing waste and barren lands for higher vegetation, and often existing on the limits of eternal snow.

SCALE-MOSS.

There are some curious little reddish or brown mosses,† which cover the rocks like a mat in such

* *Marchantia hemisphærica*.

† *Andræa nivalis*.

bleak spots, and bear their seed in tiny globes. Each globe is made up of four valves, which split open to let the seed escape, but are still held together at the top by a very small lid, which does not fall off. These little plants are called 'Split-mosses.' There are others, called 'Scale-mosses,'* not much unlike these in the shape of the seed-vessel, but having no lid, so that the four valves burst quite asunder when the seed is ripe.

"The mosses in Mary's nosegay belong to a vast family, called 'Urn-mosses;' their seed-vessels

URN-MOSS.

being urn-shaped. You have often seen on the garden wall small tufts of moss with a number of

* *Jungermannia resupinata*.

slender stalks rising from them, each stalk supporting one of these little urns."

"O yes, papa," said Mary ; "and I have looked at them through Henry's little microscope, for mamma told me they were pretty little cups with lids to them. In some of them the lids had fallen off, and I saw a number of teeth rising up round the edge of the cup, like a beautiful fringe. And mamma said, that if I counted those little teeth, I should always find them to be four times four, or four times eight, or four times some other number."

"Yes; constantly a multiple of four; and all this regular and beautiful apparatus for the protection of the minute spores or seeds which lie within. These beautiful seed-vessels, as well as the leafy appearance of the stems in mosses, will show you that they are considerably raised above lichens."

"And are they put to as many uses?" asked Henry.

"They are not. As far as the immediate health and convenience of man are concerned, mosses seem to be of little consequence, except for the beautiful green carpet they spread under his feet, in places where little else will grow.

Other moss-like plants are called ‘Club-mosses,’ because their spore-cases are often collected into a club-shaped body, not unlike a fir-cone. These delight in moist and warm climates. Thus, you see, there is great variety in this humble family.”

“Among them all,” said Mary, “what is that very beautiful pale green moss, which was sent to mamma from Crowborough, in Sussex, with such curious horns at the ends of the branches?”

“It is called ‘Stag’s-horn Moss,’* and is one of the club-mosses I have just referred to. It is remarkable, not only for its delicate colour and branching growth, but for containing in its spore-cases a fine powdery

STAG'S HORN MOSS.

* *Lycopodium clavatum*.

matter which is highly inflammable, and is employed under the name of *Lycopodium*, or *Vegetable brimstone*, in making fireworks, and in producing flashes of light which feebly imitate lightning. It is also used by the apothecary for rolling pills, which it preserves from the effects of moisture. The whole plant is emetic in its properties, as are some others of the club-mosses. Woollen cloths boiled with lycopodiums acquire the property of becoming blue when passed through a bath of Brazil wood. Club-mosses are much more abundant in the moist, hot climate of the tropics than in our temperate region."

"What plants come next to the mosses?" asked Robert.

"Near to mosses, but placed by some writers below the split mosses, come those curious plants called 'Horse-tails,'* which you see in ditches, and often gather for the purpose of pulling apart the numerous toothed divisions of the stem. These plants are found in ditches and rivers in most parts of the world. They are unimportant in a medical point of view; but owing to their containing a great quantity of silex, they are useful for polish-

* *Equisetum*.

ing household utensils. The ashes of these plants have been found by chemists to contain half their weight of silica. Horse-tails and their allies of the ditches are not far removed from FERNs, to which great tribe I now lead you."

"I should not have thought it a great tribe," said Henry, "for we see very few ferns in our walks, compared with other plants."

"That is true; but we must not always judge of a whole tribe of plants by what our own neighbourhood, or even our own country affords. Ferns in this country are leafy plants, with stems that mostly creep along the surface of the earth, or hide themselves beneath it; but in tropical countries there are tree ferns, whose leafless trunks rise to the height of thirty or forty feet, and send out an elegant tuft of foliage at the top. And although many of our woods and hedgebanks, as well as our rocks and old walls, are ornamented with very beautiful kinds of fern, yet these are not to be compared to the ferns of the tropics for number or variety. The island of Jamaica alone is said to contain at least four times as many different species as the whole of Great Britain, and some of them growing to a majestic height."

“They may be very large and handsome,” said Mary, “but I cannot fancy anything more beautiful than the fern we brought home from the woods. We little thought, as we scrambled

THE LADY-FERN.

through a mass of fern leaves, that every one of them was loaded with hundreds of little seed-vessels on the under side. It was quite by accident that I caught sight of them, scattered like little yellow beads all over the back of the leaf, or perhaps I ought to call it the branch, for there were a great many small leaves upon it.”

“In ferns it is called the *frond*, and according to its shape, and the arrangement of the seeds, you may discover the name of the species.

The large frond you brought from the woods has the seeds clustered together, along the middle vein of each leaflet. It is called 'Male Fern,'* on account of its strong growth and hardy nature. A very delicate and graceful species is called 'Lady Fern,' while another is called 'Maiden-hair.'"

Mary remembered some lines of Sir Walter Scott's about the lady-fern, and she now repeated them :—

"Where the copse-wood is the greenest,
Where the fountain glistens sheenest,
Where the morning dew lies longest,
There the lady-fern grows strongest."

"The juices of several ferns," continued her father, "have been used as medicine, and the stems of others as food: but their ordinary uses in this country are merely for thatching, or for heating ovens, or for horse-litter. But there is one thing I must not omit to say about the foreign ferns. Do you remember, Henry, having your curiosity excited by a picture of a 'Scythian lamb,' as it was called?"

"O yes, papa; it was an odd-looking thing—

* *Aspidium Filix, mas.*

half animal, half vegetable; with four legs that were exactly like the stalks of a plant."

"That was nothing more than a woolly stemmed fern, *Barometz*, common in the deserts of Scythia, and which, when deprived of its leaves, and turned upside down, is not much unlike a lamb, and has been used to deceive simple people. Ferns are altogether so curious and interesting, that I hope you will one day make them a separate study; they are the highest forms of flowerless plants, for you must have noticed that all the tribes we have yet spoken of are without blossom of any kind."

"How strange that they should have seeds, and not flowers!" said Robert.

"And that the seeds should grow in such odd places," said Mary; "some on the backs of the leaves, and some in little cups, and some in urns, and some in clubs."

"They are not true seeds, therefore you must learn to call them *spores*. You must also understand that these flowerless plants can be brought under two great divisions: first, those simple plants in which there is no distinction of leaf and stem; and secondly, those plants,

whose leaves and stems are quite distinct. Tell me what you think must belong to the first division."

"The green slime we saw in the garden," said Robert, "for even through the microscope it only looked like a bundle of threads."

"And perhaps the sea-weeds," said Mary, "for some of them seem all stem, and some of them all leaf, so that it would not be very easy to find out a regular stem and leaf on the same plant."

"And I am sure the lichens must belong to the first division," said Henry, "for they are leafy or leathery all over, lying flat on the place where they grow. Mushrooms have stems, but then they have no leaves, so I suppose they must come in the same division."

"You are right; and having thus found out the members of the first division, it follows, as a matter of course, that mosses and ferns come into the second, for in all these plants leaf and stem are perfectly distinct. In leaving these flowerless plants we find the same thing occur, which we so often noticed in rising from tribe to tribe of the animal kingdom; I mean that the tribes blend together in so gradual a manner, that we are sure

to find a great likeness to the one we have left, in that which comes immediately above it. Thus it happens that the lowest of the flowering plants look almost like flowering lichens, or mushrooms."

"Have we ever seen them?" asked Mary.

"You have not, and perhaps you never may in their own climate; for they are, I believe, wholly confined to tropical countries. They are parasites upon roots or trunks of trees, and have no true leaves, and very little stem: yet they have flowers growing immediately from the branch of the tree, and surrounded by scales, which take the place of leaves."

"They must look as if they were the blossoms of the tree itself," remarked Henry.

"They cannot be so mistaken," replied his father, "because in these parasites the whole plant is of a uniform dull colour, either brown, yellow, or purple. The scales that represent leaves, and the fungous-like mass that sometimes forms a sort of stem, is never green as in other plants. A giant parasite of this race,* when in bud, is of the size of an ordinary cabbage, and when in blossom measures a yard across."

* *Rafflesia*.

“What an enormous blossom !” exclaimed Mary, “I pity the tree that has to support it. You told us one day that lazy men and women are called ‘parasites’ when they live at the expense of their friends, without doing anything for their own support ; this immense flower must be a very expensive parasite, and must wear out the poor tree very soon.”

“All these strange plants form a sort of intermediate class between the flowerless and the flowering ; and I have mentioned them to you to-day, because I would not too closely connect them with the important division of the vegetable kingdom which will form our next subject.

CONVERSATION III.

ENDOGENS.

GRASSES, SEDGES, &c.

BEFORE their papa was ready to tell them about another division of plants, Mary and her brothers repeated to each other what they could remember about that which he had already spoken of; containing, first, plants that have no flowers, and no distinction of leaf and stem, as sea-weeds and lichens; secondly, those that have no flowers, but distinct leaves and stems, as mosses and ferns; and thirdly, such as have no true leaves or stems, but perfect flowers, as that strange giant parasite with blossoms a yard across. They were curious to know what came next, and they were soon satisfied, for their father came into the room with a bundle of dried GRASSES in his hand, which had been gathered when in blossom.

“I am obliged to be satisfied with these dry specimens,” he said, “for the spring grass is not yet forward enough to give you a good idea of this interesting tribe. We have now arrived at

true flowering plants, of which all the rest of the vegetable world is made up; but there is a very evident difference between this kind of vegetable growth which I hold in my hand, and that of trees and shrubs. Can you tell me what it is?"

Henry took hold of some of the grass, and said, "These dried stems are brittle and jointed, and when we gathered them they were tough and juicy; at first there was a leaf wrapped round the blossoms, as if to take care of them: I remember ears of wheat have just the same sort of sheath round them when they first come out. Trees and shrubs

ROUCH-STALKED MEADOW-GRASS.

are very different; they have hard woody stems, that I can cut pegs and wedges from, and I never saw this odd sheath round any of their flowers."

"But trees have no flowers," said Robert.

"Indeed they have," exclaimed his sister, "and I wonder you never saw me picking up lime blossoms and elm blossoms, under the trees. They are small, but very pretty. I like even the little purplish laurel blossoms, and the tiny dark flowers on the arbor vitæ. And oh, how pleasant it is to go down into the alder bed to get the beautiful catkins, or to run to the wood for

‘Hazel-buds with crimson gems,
Green and glossy willows.’

But perhaps you do not know what *willows* are:—they are willows; and you recollect what pretty green and shining tufts there are at the end of the willow branches in the early spring."

"Mary is wild after flowers," said Robert; "and she finds out all the early buds and catkins. She gathered all these grasses just before hay-making time last summer."

"All flowering plants," said his father, "are ranged under two great classes, or divisions, called *Endogens* and *Exogens*, from their manner of

growth. The stem in the first of these classes increases inwardly, that in the second increases outwardly."

"Our large trees must increase outwardly," said Henry, "for we saw the layers of wood in the timber that was felled last year, and you taught us about the age of a tree being known by the number of rings in the trunk."

"Exactly: but these grasses grow in the first place towards the interior, while their stalks do not increase outwardly beyond a certain size, so that they belong to the first and smallest of these two great divisions."

Henry wondered how any one could tell at first sight whether a plant grew inwardly or outwardly, and his father directed him to a sim-

FOX-TAIL GRASS

ple and easy mark of these different manners of growth.

“The plants that increase within,” he said, “have the veins of their leaves in straight lines from one end of the leaf to the other, and those that increase without have a beautiful network of veins all over the leaf. If you collect a few leaves from the garden, you will soon see the difference.”

The children ran into the flower-garden and gathered such early leaves as they could find ; and bringing them to their father, he held up to the light a crocus and a hyacinth leaf, and showed them how beautifully regular are the parallel veins running from end to end.

“This shows that crocuses and hyacinths are endogens,” he said ; “but if you look at these lilac and ivy, and primrose and violet leaves, you see at a glance that the veins branch out from the rib which runs down the middle of the leaf, and then subdivide into a kind of network ; therefore these leaves belong to exogens.”

“Oh yes, papa,” said Mary, “and that is what makes skeleton-leaves so pretty. How very easy it will be to find out which are endogens and

which are exogens ! but I wish they had not such hard names."

"Those names simply mean, 'growing inwardly,' and 'growing outwardly;' and they are the only hard names I shall trouble you with for a long time."

"And how many plants belong to this straight-veined division, or endogens?" asked Henry.

"Very many that you are acquainted with, and very many more that you know nothing about. In the first place, there is the great tribe containing the various grasses which clothe the hills and valleys with verdure, and in many cases bear precious grain; for oats, barley, wheat, rye, maize, and rice, are all produced by plants of this tribe; while the inferior kinds of grass feed our flocks and herds, and thus do us nearly as much service as the others. But you must not suppose that all the pastures of the earth consist of the same kind of short sweet herbage with which our own fields and meadows are covered. In South America there are field crops of grass, especially on the banks of the river Amazon, which grow to the height of six or seven feet, and yet are perfectly tender and delicate."

"We might easily lose ourselves in such a field as that," said Henry; "and even tall men would not be able to see each other over the tops of the grass."

"On the Falkland Islands there is an extraordinary kind of grass, growing in large tufts or hillocks, which hide the view of the cattle feeding among them. I have seen some of this grass growing in the Botanical Gardens at Kew: but it was a poor little stunted specimen compared with the descriptions of the *tussac grass*, as it is called, in its native country."

"What a good thing it is," said Robert, "that grass comes up everywhere without any trouble!"

"It is a great mercy," replied his father, "that God has 'made the grass to grow upon the mountains, and green herb for the service of men.' It is also matter for thankfulness that by the skill and industry of the farmer, our fields are sown with the best varieties of these grasses, mixed in such proportions as are suited to the wants of our cattle. Uncivilized nations move from place to place in search of fresh pastures; but civilized people carefully cultivate the same land year after year, and make it yield as much as possible."

Some of the grasses smell very sweetly when they are in blossom," said Mary, "and I dare say they have a sweet taste to cows and sheep."

"No doubt. Sugar is to be found in most grasses, and the sugar-cane is itself a grass. Maize or Indian corn also abounds in sugar, and has been recommended for cultivation as a substitute for the sugar-cane."

"What a useful tribe," remarked Henry. "It would be worth while to make out a list of the things the grasses are used for. It would be a very long one; for, besides the use of the grass itself and the different kinds of grain, there would be hay and straw to notice, and all the things that are made of them."

"And the use of reeds and canes," said his father, "which are only large grasses. But SEDGES,* which much resemble grasses in outward appearance, are a distinct tribe, and have not the same nourishing qualities; they are therefore not much sought after by cattle. You have seen them growing up in marshy places, and have noticed their frequently having a sharp triangular stem, which will almost cut your fingers. The

* Cyperus.

Papyrus of the banks of the Nile is a species of sedge, and so is the pretty Cotton-grass,* of which Mary brought home so much last summer."

COTTON GRASS.

"Almost enough to make a pillow," replied the

* Eriophorum.

little girl ; “and when I have collected some more I am to sleep upon it, and it will be just like a pillow of down.”

Robert wished to know what is the real use of the silky tufts on the cotton-grass, and he was told that they surround the seed, and are intended to waft it to different places.

“But before I proceed further,” said his father, “I must mention weeds that are very familiar to you, as forming a dense green covering to ditches, pools, and lakes. There are several species of DUCKWEED, but two only are common in our

LESSER DUCKWEED.

ditches : perhaps the one best known to you is the Lesser Duckweed,* the simplest of all flowering plants.”

* *Lemna minor*.

"I have often skimmed off some of it from the water," said Mary, "but I never found any flowers; only little green scales without any stems, and with a delicate little fibre for a root."

"I do not wonder at your not finding the flowers, for they are enclosed in a delicate membranous bag, and are kept concealed in a slit of the leaf."

"What a droll place for them! They shall not hide themselves from me, for I mean to search for them with my little microscope. But why are these plants called duckweeds?"

"Because all the species are said to be eaten by ducks and other aquatic birds. Their botanical name of *Lemna* means a *scale*."

"Near to the grasses are found certain tribes having a general tendency to one manner of growth, namely, to bear their flowers upon a club-shaped *spadix*, as it is called. The common Arum,* or 'Lords and Ladies,' or 'Cuckoo Pint,' has this kind of spadix, and is a good example of a tribe of plants chiefly confined to the tropics, where they grow to a considerable size."

"I thought 'Lords and Ladies' had no flowers;

* *Arum maculatum*.

but only poisonous red berries wrapped up in a curious hood," said Robert.

CUCKOO PINT.

"I do not wonder at your thinking so, for the

flowers are naked ; that is, they have no petals, or flower-leaves, but only those parts which are necessary for the formation of the seed. The berries are very poisonous, but the root can be manufactured into a kind of sago. The hood you speak of is a very curious mantle for the protection of these naked flowers ; it is called the *spathe*. There is another plant which you are fond of searching for, and which bears its flowers on a spadix or club, but it has no spathe to wrap them up in."

The children could not guess what plant it was until their father said it grew in ditches, when they immediately recollected the Bulrush.*

"Not that it is properly a *rush*," continued their father ; "for the rush tribe has a higher place in the vegetable system ; but it is a curious sedgy plant, bearing numerous and nearly naked flowers on its spadix. I cannot enter into descriptions which belong to the scientific part of botany ; but I may often lead you to notice the more conspicuous features of the different tribes, and this will be a great help to you. The grasses and the arum group will be sufficient for our present conversation : to-morrow we will talk about the palms."

* Typha.

CONVERSATION IV.

PALM—AMARYLLIS—IRIS—PLANTAIN—GINGER—ARROWROOT—
ORCHIS—RUSH—AUTUMN CROCUS, AND LILY TRIBES.

“ The palm-tree in the wilderness
Majestic lifts its head,
And blooms in solitary grace
Where all around is dead.”

MARY had read some verses, beginning in this manner, and she tried to find them, and also to learn the different uses of PALMS, before her father came into the study. She found out that in Egypt, Arabia, and Persia, people make their principal food of the fruit; that they make couches, baskets, bags, mats, and brushes from the leaves, and also roof their houses with them; and that they make garden-fences, and cages for poultry from the branches; besides using the fibres for thread, ropes, and rigging. Her father told her that the uses of the palms are almost endless; for, according to Humboldt, wine, oil, wax, flour, sugar, sago, and salt are obtained from the tribe, besides many inferior articles.

“Even in England,” said Henry, “the cocoa-nut palm is very useful ; for we get the nut to eat, and the shell polished for cups, and the fibres made into beautiful matting.”

“And mamma says that soap and candles are made of palm-oil ; and that the little box on the chimney-piece, which we call vegetable ivory, is made of the kernel of a sort of palm,” added Mary.

“I have seen pictures of palm-trees,” said Robert, “and they seem to be very tall trees, with a single stem and large tufts of leaves at the top.”

“That is their common appearance ; but there are at least four hundred distinct species of palms (and perhaps many more) ; and among these there is considerable variety : so that palms are occasionally met with that are of a shrubby or branched growth, or are armed with stiff spines. Quite in character with the immense size of the leaves in palms, is the enormous cluster of blossoms contained in each spathe ; for these trees, like our common arum, have a large spathe for the protection of their fruit. Here is a drawing of a palm blossom, which will show you how the florets are clustered together : they sometimes amount to two hundred thousand in a single spathe.”

“If that is the case,” said Henry, “I dare say there is a great deal of seed: and it is a wonder that the palm ever grows up alone, and blooms ‘in solitary grace,’ as Mary’s lines say.”

“Its places of growth are various,” said his father; “so that one who has closely studied the habits of this noble race, says, ‘not a few love the humid banks of rivulets and streams; others occupy the shores of the ocean, and some ascend into alpine regions; some collect into dense forests, others spring up singly or in clusters over the plains.’ But this you must understand of the sunny regions within the tropics, beyond which these plants do not extend.

PALM BLOSSOM.

“In palms we have the grandest form of endogens, many of the species consisting of trees of gigantic

stature and graceful shape, and with leaves of such enormous size and strength that the midribs serve for oars. The juice of the flower and stems in the cocoa-nut palm is distilled into a spirit called *arrack*. The fruit and the milk which it contains are well known to you, but you have little idea of their

CLUSTER FROM THE DATE PALM.

delicious flavour when fresh gathered. The juice which flows from the wounded spathes, in this and

other species of palms, is known in India as *Toddy*, or Palm wine, and has grateful and cooling properties. The pith of some palms is made into bread by the natives, and is boiled into thick gruel resembling sago. The true Sago Palm is so rich in that substance that each tree is computed to yield from 600 to 800 lbs. Only a comparatively small number of the palms have eatable fruit. Besides the Cocoa-nut, there is the Date Palm,* which furnishes the chief food of desert tribes, the Doom Palm,† called in Egypt the Gingerbread Tree, owing to its dark-brown mealy rind, and a few others of small importance. Some of those palms from whose trunks sugar and sago are obtained have, nevertheless, exceedingly acrid fruit, exciting inflammation in the mouth.

“The tribes immediately above palms are chiefly floating or water-plants, and most of them foreign : a few families, however, come with the familiar names of “frog-bit,”‡ “water-soldier,”§ &c. Near these are the pine-apple and agave, or American aloe ; the latter belonging to the tribe|| which contains our snowdrop and daffodil.”

* *Phoenix dactylifera*. † *Hyphæne thebaica*. ‡ *Hydrocharis*.

§ *Stratiotes*.

|| The Amaryllis tribe.

Robert asked if it is true that the aloe **only** flowers once in a hundred years, and was answered in the negative.

NARCISUS.

“The agave, of which this fable is told, is a hardy and useful plant, forming in its native country excellent hedges, which it is impossible to penetrate. The fibres of the leaves are used as thread, and are manufactured into paper. Some of the families contained in this tribe have a poisonous juice in their bulbs, especially a species* growing at the Cape of Good Hope, in which the Hottentots are said to dip their arrow-heads. Here is one of our prettiest spring flowers, the Narcissus, but this, as well as

* *Hæmanthus toxicarius.*

the snowdrop and daffodil, has a share of the same quality. The bulbs of these plants have long been known as emetic. Infants, who are fond of putting everything into their mouths, have been seriously injured by swallowing daffodil blossoms, which shows that some of the poisonous principle resides also in the flowers."

"I am disappointed that my pretty snowdrops have anything poisonous about them," said Mary. "I hope those handsome purple and yellow crocuses are better off."

"They belong to the IRIS tribe, and I cannot flatter you that all are free from similar qualities; however, the crocus itself is rather beneficial than

SPRING CROCUS.

otherwise, and it is from one* of its family that we get saffron. The saffron crocus flowers in September, and is of a deep purple, with orange-coloured stamens, which, when dried, form the saffron."

"Why does mamma put saffron in the canary's drinking-glass when he is moulting?" asked Robert.

"Because it is of a warm and stimulating nature, and appears to render the same sort of service to the bird, in helping him to throw off his feathers, as it does to human beings in helping them to throw out troublesome eruptions of the skin. Medical men frequently use it for this latter purpose on the Continent, and I believe in this country also. In the same tribe are some handsome garden flowers, the *Gladiolus Ixia*, and the varieties of *Iris*, all more or less suspicious in their qualities. We have now to leave these familiar plants, and pass to a small tribe containing the plantains and bananas, valuable tropical fruits, of which you have often heard."

"It seems strange to pass from our little crocuses to those great trees," said Robert.

* *Crocus sativus*.

“Not *trees*,” replied his father, “although they are twenty or thirty feet high.”

“But in pictures, papa, they look something like palms, and I fancied that they were trees like them.”

“They are so far from being trees, that they have no true stem : the enormous leaves sheathing round each other form a kind of spurious stem, of great size, tapering as it ascends, and in the centre of which rises a spathe of flowers, followed by clusters of fruit.”

“Then they are something like crocuses in having no stem ; but they are better off than crocuses, in bearing fruit. What sort of fruit is it?”

“In appearance I am told that the unripe plantain is exceedingly like a large cucumber.”

“How ugly !” said Mary. “Fancy a cluster of cucumbers !”

“If they are not very pretty to look at, plantains and bananas are very wholesome, and some of them very delicious as food. The plantain* is the coarser kind preferred by the natives, and cooked before it is ripe as a vegetable, or eaten

* *Musa paradisiaca*.

ripe as food. The banana* is a shorter, thicker fruit, greatly preferred by Europeans in tropical countries, and reminding them of our finest-flavoured apples and pears. Indian cottages are thatched with the leaves of the plantain, and the tables are spread with them as a natural cloth. The plants also furnish many useful articles, especially flax, from which some of the finest muslins of India are prepared. Among the tribes closely following this, we meet with other examples of warm and stimulating qualities in the GINGER tribe, a very useful race of plants."

"Green ginger preserves are delicious," said Henry; "and people make ginger wine and ginger beer, otherwise I should not think ginger very useful."

"All the ginger plants are natives of hot climates, where the inhabitants need this sort of stimulant more than we do, and chew such powerful spices with much pleasure."

The children would have been surprised to hear this, had they not seen a Hindoo servant shortly before, whose mistress was accustomed to treat

* *Musa sapientum*.

her with nutmegs and ginger, just as we should treat a child with sugar-plums.

“Ginger, as you know, is the *root* of the plant; but several plants of this kind produce very pungent seeds, as the cardamoms, and some a still hotter kind, called *Grains-of-Paradise*. Others yield a dye, as turmeric, which is much used in manufactures. The pretty plant called Indian Shot, of which we once had several specimens in the conservatory, belongs to a neighbouring tribe, called the ARROW-ROOT tribe. Three or four of the species yield arrow-root in abundance, but especially one,* which is much cultivated in the West India Islands.”

“How do they get the arrowroot from the plant?” asked Mary.

“When the roots are a year old, they are dug up, washed, and grated, or beaten to a pulp in wooden mortars. This pulp is thrown into clean water, and stirred about to separate the fibrous parts, which are collected in the hand. The milky liquor which remains is poured through a sieve, and afterwards allowed to settle for some time. The arrowroot sinks to the bottom, and

* *Maranta arundinacea*.

when the water is poured off, the white pasty mass that remains is placed on clean white cloths in the sun to dry. It is then fit for use, and will keep for a very long time."

"What is the plant like?" asked Robert.

"It is a handsome plant, with long and broad leaves, of a very rich green. I will show you a hot-house specimen on the first opportunity."

The children were now told that they had arrived at a very curious and remarkable race of plants, different in many respects from other tribes, but not the less interesting to botanists, or even to common observers.

"Do you remember," said their father, "the odd-looking Bee-orchis we used to watch for so eagerly every spring? There were a few roots in a corner of the orchard, but unfortunately they have now died away."

"Oh yes, papa," said Mary, "it looked exactly like a bee settled on a flower."

"One of the marks of the ORCHIS tribe, is the very general enlargement, and often the very curious shape and appearance, of one of the inner rows of petals. In the bee-orchis it is quite different from all the other petals, being of a dark

colour, velvety texture, and looking, at a little dis-

BUTTERFLY-ORCHIS.

tance, very much like a bee. In another, it re-

sembles a fly; in another, a lady's slipper, and so on, giving corresponding names to the different species. You are fond of searching for some of the common kinds of orchis in the woods and marshy places where they grow; but from these poor little terrestrial plants you can scarcely form an idea of the orchids of tropical countries; where, instead of being content with such a lowly situation, they take root among the branches of living trees, or spring from the decaying bark of those that have fallen, putting forth the most brilliant and remarkable flowers, which, towards evening, give out a delicious scent. I must contrive a visit for you to some botanical garden where orchids are reared; and if you can bear for a few minutes the hot damp atmosphere, which is artificially created for them to live in, you will be delighted and amazed at the extraordinary shapes of the flowers, and at the curious growth of the plants, frequently parasitical, on little logs of wood suspended from the roof of the hot-house."

"What is the use of these curious plants?" asked Henry.

"In many, we see more beauty than use; but there are several which are applied to economical

purposes. A nourishing substance called *salep* is obtained from the roots of one species ;* *vanilla*, used in the manufacture of chocolate, of liqueurs, and confectionary, is the dried fruit of another ;† while the roots of a third‡ are so gummy that they are used in the United States for mending broken earthenware, and are called *putty-root*."

"I wish putty-root grew here," said Robert, "that I might mend mamma's broken china."

"Besides this," continued his father, "a few are taken medicinally ; and in New Holland the mealy roots of many species are eaten by the natives. Near to the orchis tribe come several tribes of water-plants or marsh-plants, all natives of warm climates, and more interesting to the botanist than they would be to you ; let us, therefore, proceed to the RUSHES."

The children were very familiar with rushes, and Mary was in the habit of peeling them for the sake of a beautiful white pith with which their stems are filled, and which her mamma had taught her to apply to many ornamental purposes. They also knew that *rush*-lights are candles in which

* *Orchis mascula*.

† *Vanilla planifolia*.

‡ *Aplectrum hyemale*.

SOFT RUSH.

(Juncus effusus.)

this pith is used for a wick, and that a great many useful things are made of rushes.

"These plants," said their father, "are mostly natives of cold countries, although several are found in the tropics. Even in the severe climate of Melville Island, our arctic voyagers found two species of rush. A damp and cold soil appears to suit them best; and where rushes spring up it is generally a sign that the land wants draining."

"But I have seen them growing on dry heaths," said Henry.

"That may be. Heaths are frequently dry on the surface, while a little way beneath is a cold clay, in which rushes would flourish. Large tracts of land in Japan are devoted to the cultivation of rushes, and are flooded at intervals like rice grounds: this large supply of rushes is entirely devoted to the making of rush-matting for covering floors. You have seen the basket-maker in our village using rushes for mats, chair-bottoms, and other articles, therefore I need say no more of their uses. We now approach the lilies, first pausing at a dangerous tribe, called the MEADOW-SAFFRON tribe, in which there are some fatal poisons, as well as some useful medicines. Do you remem-

ber the pale purple crocuses that came up without leaves in September?"

"Yes, papa," said Robert, "I had two or three in my garden, and now there are leaves coming up without blossoms. How odd it is that the leaves and the flowers are so far apart!"

"This will help you to distinguish it from the spring crocus, and also from the useful Saffron Crocus, which belong to another family. This autumn crocus,* or meadow saffron, which we are glad to see when other flowers are gone, is yet a dangerous plant; and there are well-known cases of poisoning from chewing the bulb or the young shoots."

"Would any one except a baby be so foolish as to chew it?" inquired Henry.

"Some time ago a poor woman picked up a few of these crocus roots in Covent-garden market, and fancied they were onions. One would have thought that she must have missed the powerful odour of the onion, and so have discovered her mistake, but unfortunately she did not; but ate them, and was poisoned. Another plant of this

* *Colchicum autumnale.*

tribe, called White Hellebore,* is a nauseous and dangerous plant, containing a peculiar principle called *veratria*, which acts in a singular manner on the nose, producing most violent sneezing when taken as snuff in ever so small a quantity. It has a similar irritating effect when taken into the stomach, and a few grains tried on some of the lower animals have been fatal."

"Is it not very cruel to try the effect of poison on cats and dogs?" asked Henry.

"Exceedingly cruel if it is done for mere sport or curiosity; but if there is a prospect of saving human life by it, or of doing some important service to mankind, then it is lawful and proper to make experiments of this sort. But let us leave this gloomy race of plants, and proceed to their near neighbours, the more innocent and beautiful lilies."

"Is that a large tribe, papa?" asked Mary. "I can only think of five sorts, the tall white lilies, and the orange-coloured, and the Turk's-cap, and the trumpet, and the dear sweet little lilies of the valley."

"The LILY tribe," said her father, "is very ex-

* *Veratrum album*.

THE VERNAL SQUILL.

tensive ; for in reality the showy tulips, the speckled bell-shaped fritillaries, the sweet tuberose, the elegant agapanthus, and the fragrant hyacinths, rank with lilies ; and there are many useful plants, such as onions, asparagus, squills, aloes, &c., which are also placed by Lindley in his great order of Lily-worts."

"I thought you had told us about aloes before, papa," said Robert.

"I spoke of the *Agave*, or American aloe, which is said to flower once in a hundred years ; but that is of a different family, and has very different properties from the true aloes, several species of which are used in medicine.* These latter are tree-like plants growing in tropical countries. Some of the relations of our lilies, indeed, grow to a majestic height in those warm climates, and from their stem and leaves various gums or resins are collected, some of which are useful in medicine, especially *dragon's blood*, the strange name of a resin which comes from a very large species,† growing to the height of sixty or seventy feet in the Canary Islands."

* *Aloe vulgaris*, *A. soccotrina*, and others.

† *Dracænas Draco*.

“What grand and beautiful things the lilies must be!” exclaimed Mary. “Which of them do you think it was, papa, that our Saviour spoke of, when He said that ‘even Solomon in all his glory was not arrayed like one of these?’”

“Probably those ‘lilies of the field’ were the scarlet lilies,* which still spring up freely on the plains of Syria.”

Robert was disappointed at hearing this; for he had made up his mind that our humble lilies of the valley were the flowers which our Saviour had condescended to notice.

The children were told that several tribes of plants, following lilies, are natives of marshes or slow-running water in foreign countries; and that of one of them the only British specimen is the Flowering Rush, one of the most beautiful of our wild flowers, and which gives its name to the tribe. The WATER-PLANTAIN tribe contains several common inhabitants of ponds and ditches, some of them much resembling the crow-foot of the meadows.”

“I remember,” said Mary, “finding flowers that reminded me of buttercups in the pond at the bottom of the lane, but they grew more of them

* *Lilium Chalcedonicum*.

FLOWERING RUSH.

(*Butomus umbellatus*.)

together on the stem, and instead of being yellow, they were of a sort of flesh-colour."

"That was the common arrow-head* so named from its arrow-shaped leaves, and belonging to the Water-plantains.

ARROW-HEAD.

"The pond-weed† is a common British example of another of those tribes of marsh-growing plants which I have referred to as chiefly foreign.

"Immediately succeeding these," said their father, "there is a group containing half a dozen tribes that would be very puzzling to you, were they common plants. Although their growth is like that of endogens, yet they have net-veined leaves,

which you know is a sign of the exogens. I shall not trouble you with the names of these tribes,

* *Sagittaria sagittifolia*.

† *Potamogeton natans*.

because nearly all the plants are natives of hot countries, and are not likely to offer any difficulty to us. Among them are the useful yams, cultivated as potatoes, and the esteemed sarsaparilla plants, much employed in medicine. But if you want an English specimen of this kind of growth, you must search for Herb Paris, that odd-looking plant called by country people True Love, which grows about a foot high, and bears four broad egg-shaped leaves at the top of the stem, and a green blossom followed by a purplish-black berry."

"I wonder what makes these plants so different from all the rest of the endogens," said Henry. "Perhaps we are coming near the net-veined plants, and so these are gradually getting like them, just as the tribes of animals gradually came near each other, as we travelled upwards."

"You are right, Henry," said his father: "we are now coming to the important and almost endless races of exogens, which make up the great bulk of the vegetable kingdom. And now I must tell you of another mark by which the three great divisions of the vegetable world are distinguished by botanists. The first or flowerless division has no true seeds; the second and third divisions have

seeds, but they are differently formed. The seed of an endogen, when it first begins to grow, sends downwards a slender root called the radical, and upwards a single seed-leaf or lobe, which is the beginning of the young plant. But the exogens do more than this, for they send up two seed-leaves instead of one, as you may have often noticed in lupines and other plants, where the two thick fleshy seed-leaves push through the soil, nourishing and protecting the young plant, and having a very different appearance from the leaves which come afterwards. Sometimes these seed-leaves remain underground, as in the Windsor bean, and gradually die away when their purpose is answered. Even before the seed has begun to sprout, these differences are visible with the microscope; but it is not often necessary to examine the seed in this way, because there is such a very plain and simple means of knowing endogens from exogens without it."

"You mean the straight-veined leaves and the net-veined," said Henry. "Yes, that is a very nice way of knowing them apart, and so little trouble: I am getting quite a habit of holding up leaves to the light to see which division they belong to.

But, papa," he added, "do you not think that there is something about endogens that would almost tell you what they are at a distance, without examining the leaves? Look at the lilies and daffodils in the garden; how delicate they seem, as if they grew up very quickly, and would not last long. They do not look strong and hardy like other plants."

"Endogens," said his father, "are less highly organized than exogens, and are, generally speaking, very short-lived. There are exceptions to this, for some of the palms live two or three hundred years; but even in this case their existence is short, compared with that of many of our forest trees. Before we begin our last great division of the vegetable world, let me give you one other character by which endogens are in most cases to be known. In examining their flowers we shall find the number three, or some multiple of that number, to prevail, while in exogens the number five, or its multiple, generally prevails."

Mary gathered a snowdrop, and looked at the blossom. "There are more than three of these pretty white petals," she said.

Her father pointed out to her that there are six

(twice three), arranged in two rows, one within the other, three petals in each row. He also pointed out six stamens, and then opened the seed-vessel, which looked like a little green berry; and there Mary saw three distinct cells for holding the seed. "As the spring flowers open," said her father, "take notice how many have the number three conspicuous. You will find that lilies of the valley, although they have but one petal to make up their delicate, cup-shaped flower, yet have this cup divided at its edges into six (twice three) segments, enclosing six stamens, while the seed-vessel has also three cells. The same is the case with the hyacinth. In the tulip and narcissus you will find the petals six, stamens six, and cells of the capsule three. Thus you may go on with numerous examples, and I would gladly see you gaining this sort of general knowledge of endogens, before you puzzle yourselves with the difficult words which are necessary to express their botanical characters."

CONVERSATION V.

EXOGENS.

PINE—YEW—BEEF-WOOD—WILLOW—NETTLE—HEMP—
MULBERRY, AND PLANE TRIBES.

THE young larch firs in the plantation had now put on their beautiful green foliage, and the children were comparing their delicate colour with the dark green of the hardy spruce fir, and with the deep bluish-green of the Scotch fir, when their father asked them how they should know that these trees, so different in colour, were all of one tribe.

“Very easily, papa,” said Henry; “because they all have needle-shaped leaves, and they all bear cones.”

“And they all have a very pleasant smell,” added Mary, “for that is the reason why we gather fir-cones in autumn. Mamma sometimes has a few of the dried cones put on the drawing-room fire, where they blaze up very quickly, and scent the room; and we put some in our clothes-drawers to

keep away the moth, for the insect does not like the smell that we are so fond of."

CONES OF SPRUCE-FIR.

"The three marks you have mentioned," said

their father, "are indeed true signs of the PINE tribe, the members of which all bear cones, and are therefore called Conifers: and also have peculiar spiny leaves, and contain an abundance of strong-smelling resin. But can you tell me whether they are endogens or exogens?"

Mary said she could hardly tell by looking at the leaves, because they were so narrow, but she fancied they were straight-veined. Henry did not think so, and he felt sure the trees were exogens, from their hard and woody growth. Robert, too, remembered that his father had said that all our forest trees are exogens, so this settled the matter—yet they were told that because of some differences connected with the seed, these trees have sometimes been considered a distinct class.

"I shall scarcely do wrong, however," said their father, "in calling them the lowest race of exogens, from which they do not differ in growth, but increase exactly in the same manner, by yearly additions to the outer portion of the wood."

"I cannot understand how trees get their new layer every year without our noticing it," said Mary; "there are the elms at the end of the garden, with their rough old trunks; I play under

them nearly every day, and I do not see the old bark fall off, and a new one come instead of it."

"These new layers of wood are formed under the bark, and out of our sight. You have seen people stripping off the bark from trees after they are cut down, and you must have noticed how easily it comes off; it is, indeed, quite distinct from the wood, and has a gummy substance between it and the true wood."

"Then as the wood goes on increasing, does the bark stretch very much, or how does it manage to make room?"

"The bark itself is also gradually renewed on its inner side, while the outer portion cracks and peels off, or perishes by slow degrees. Thus, while the solid trunk of the tree is formed by zone *upon* zone of new wood, which is added in succession, year after year, the bark is renewed by zone *within* zone of fresh material; but with this difference;—in the bark, the outside perishes, and a new layer adapted to the increasing size of the tree gradually takes its place; in the true wood every layer is permanent, and forms solid timber."

"Then," said Mary, "the old bark is obliged to

keep on giving way to the young bark ; but that must get old-looking too before it comes up in sight, or else we should see a greater difference in the tree than we do."

"All these processes take place so gradually that we are unconscious of them, just as we are generally unconscious of the changes going on in our own bodies, where new material takes the place of the old in a very similar manner."

Robert held up his fingers to show that some of the skin was peeling off, and that new skin had formed underneath ; upon which Henry compared him to a young birch-tree, whose silvery bark often peels off in long thin slips. "You forget," said Robert, "that young birch-trees make very good rods," and he began playfully to chastise his brother, when their father called them back to the subject of conversation, by saying,—

"The pine tribe is an exceedingly valuable one, on account of its timber, which is well known, as deal, fir, cedar, &c. There are vast forests of pines in North America, and in some parts of northern Europe. The loftier species make capital masts for ships, while some others, as cedar, cypress, and juniper, are noted for the extraordinary

durability of their timber. The celebrated gates of Constantinople, which lasted eleven hundred years were made of cypress. The different kinds of resinous matter obtained from pines are also very valuable, and are known as turpentine, pitch, balsam, sandarach, &c. The berries of the common juniper are used in flavouring gin, and the large seeds of some of the pines are eatable when fresh."

"Pines are useful, indeed," said Henry; "but I always thought our hardest and strongest wood was yew-tree wood. I have heard that the ancient Britons made their bows of it, and they were famous ones, very strong and elastic."

"That is true," said his father; "and the YEW tribe, which comes next to the pine tribe, is not to be surpassed as to the durability of its timber; but the tribe must still be considered far less valuable, because the trees are much less common. In Europe we have only one species, the common yew.* Asia is richer in trees of this kind; and in New Zealand the most valuable timber is gained from members of the tribe. I must warn you, however, that the leaves of the common yew are very poisonous."

* *Taxus baccata.*

Robert was surprised to hear this; and he thought he must have had a narrow escape from

LEAF AND FLOWER OF THE YEW.

poisoning, for he well remembered being tempted

to eat some of the pretty rose-coloured berries of the yew. His father told him that the soft part of the berry is quite harmless, if the seed is not swallowed; but he advised him in future not to meddle with any strange fruit, however tempting its appearance.

"There are several foreign trees," said his father, "whose wood is not very inferior to that of the yew in hardness; but I shall now lead you to a group which may be known by having their flowers arranged in *catkins*, as we are accustomed to call their dense spikes of blossom. Foremost are the BEEF-WOODS,* a curious tribe of trees and bushes in Australia, whose great peculiarity is, that they have no leaves."

"Dear papa, what odd trees!" said Mary; "how strange it seems that they should be able to live and grow without leaves. *Our* trees have no leaves in winter, but when summer comes, if any of them are leafless we know that they are dead."

"These Australian trees have drooping jointed branches, and at every joint there are little sheaths, occupying the place where we should expect the leaves to grow. Their flowers are in catkins, and

* *Casuarina*.

the seed is collected into a sort of cone, which once led to the opinion that they belonged to the pine tribe."

"I am glad they have catkins and cones to show that they are living, and not dead trees," said Mary; "but I should like to know why they have the odd name of beef-wood trees."

"They are called so by the colonists because the timber is very much the colour of raw beef. One of the species is also called the *she-oak*, because its branches and cones contain a pleasant acid, and travellers suffering from thirst obtain great relief by chewing them. I must now ask Mary, who is

BEEF-WOOD TREE.

so fond of catkins, to name some other trees which bear them."

BLOSSOM OF ALDER.

Mary soon thought of the birch* and the alder,† which her father told her were near relations, and, with few exceptions, more valuable as ornaments than as timber. "Among birch," he said, "there is a tree in North America‡ with so tough and thick a bark, that the Indians make boats of it, and various other useful articles. Our common birch§ yields an oil which gives the peculiar smell to Russia leather, which is dressed with it. A sparkling wine can also be obtained from the sap of the birch, and some North American species furnish excellent sugar.

* Betula.

† B. papyracea.

‡ Alnus.

§ B. alba.

The alder is less remarkable for its uses; but there is a bitter principle in its bark which has been employed medicinally."

BLOSSOM OF WILLOW.

"I have thought of some other trees with catkins," said Mary. "All the willows and poplars seem to have them; for I have seen them on the weeping willow that grows by the water, and on

the common willows, and on the tall Lombardy poplars, and on the quivering aspen."

"True," said her father; "the WILLOW tribe, including all the willows* and poplars,† has this general mark of relationship, besides others which

LEAF OF WHITE POPLAR.

bind the families especially into one tribe. Their wood is sometimes valuable as timber, but oftener for common domestic purposes. Henry's cricket-bat is made of the common white willow;‡ your

* *Salix*.

† *Populus*.

‡ *S. alba*.

weeding-basket, Mary, is of the common osier,* and your mamma has a basket made of the fine basket osier, which grows in meadows and marshy places in Norfolk and Cambridgeshire. Robert's arrows are made of the aspen,† and most of our charcoal is made from sallows."

Robert wished to know why willows are sometimes called osiers and sallows; and he was told that these names help to distinguish the different species in this extensive family, which contains upwards of sixty distinct species, natives of Britain; so that the study of willows is not a little puzzling to young botanists.

"Let us now pass on," said his father, "to a neighbouring group, which is chiefly distinguished from this by the flowers not being commonly arranged in catkins. I shall first notice the nettle tribe."

"Why is the nettle put among trees?" asked Robert.

"Because it resembles these particular trees in important botanical particulars. But the nettle is not always the despised weed it is with us. Some of the species grow to the height of trees, and have

* *S. viminalis*.

† *P. tremula*.

their branched form; but the wood is very light and spongy."

"Nettles are of no use, are they, papa, but really mischievous, on account of their sting?"

"We have no right to say of any created thing that it is of no use; and if you were acquainted with old herbals, you would find great virtues ascribed to nettles, and to their relation, 'Pellitory of the Wall.' But if we do not place entire faith in these accounts, we yet learn that cordage can be made from nettles; that a species with tuberous roots* has been used instead of potatoes, and that even the stinging quality has been made use of in cases of paralysis, the benumbed limb being flogged with nettles, to restore sensation."

Mary said, that if there was any life left in the limb, the person would be sure to feel the sting; but her father told her that he had never heard of a case in which this rough treatment was of much service.

"As some nettles," he said, "can be made into cordage, so the HEMP tribe, which follows, is of great service, on account of the tough fibres of the well-known hemp,† from which our ropes, door-

* *Urtica tuberosa*.

† *Cannabis sativa*.

mats, &c., are manufactured. In temperate climates this is the grand use of hemp; but in hot countries

COMMON HOP.
(*Humulus lupulus*.)

it also affords a resin, which has intoxicating properties, producing drowsiness and drunkenness.

In this sleep-producing property it resembles its near relation, the hop, which belongs to this tribe, and is a well-known ingredient in beer."

"Hops are very pretty," said Mary; "but I should not like them to be trained over trellis-work as some people have them, in their gardens; because whenever I touched the blossoms they would give out that disagreeable bitter smell."

"Many persons think it a fine aromatic smell," said her father; "it is produced by little glands (easily rubbed off), which are scattered over the green scales of the hop-head, and contain a bitter resin. But we must proceed to the MULBERRY tribe."

The mulberry-tree was a great favourite with the children, not only on account of the rich fruit which it afforded them, just in the hottest weather, but also on account of the supply of leaves it yielded to their silkworms. They were surprised to hear that the fig-tree belongs to this tribe, and that both have been brought from the East, the whole tribe being of foreign origin. Their father spoke of the fig-trees as especially interesting, since one of them is the remarkable banyan-tree* of

* *Ficus indica.*

India, whose immense branches send down shoots to the earth, which take root, and form pillars for the support of the extended foliage.

“Bring Milton’s works,” he said; “look in the ninth book of *Paradise Lost*, for some mention of this method of growth in the banyan-tree.”

Henry read as follows:—

“The bended twigs take root, and daughters grow
About the mother-tree, a pillar’d shade
High over-arch’d, and echoing walks between.”

“What beautiful shady groves it must make,” said Mary; “and how pleasant it must be in that hot country to have such a shelter!”

Her father replied, “The poet Southey, describing a banyan-tree, says:—

‘So like a temple did it seem, that there
The pious heart’s first impulse would be prayer:’

we may, therefore, make due allowance for the poor Hindoo, who in performing his devotions near this tree, considers, in his ignorance, that the banyan itself is an object of worship. There is something very touching, to my mind, in the reverence and gratitude which the heathen show to natural objects, such as the sun and moon, rivers, trees, and

animals. Sensible of the blessings conferred upon them, and ignorant of the source from whence they

ORIENTAL PLANE.

come, these poor creatures worship the gifts instead of the Giver ; and grievous as this error is, yet it

does not seem so gross and debasing as the worship of images, the work of men's hand."

"Another day," said Mary, "the poor little Hindoo children will be taught not to worship the river Ganges, or the banyan-tree, but Him who made all the beautiful groves and streams."

"God grant it may be so," said her father.

Henry now inquired whether fig-trees are of any other use than to give fruit and shade; and he was told that they furnish India-rubber in great abundance, and that in some of them their milky fluid forms a wholesome beverage, giving them the name of *cow-trees*. He was also told that the PLANE tribe, containing fine timber trees, natives of Barbary, the Levant, and North America, and represented in this country by the noble plane-tree,* which affords so much shade, is not far removed from the mulberry and fig, although its juice is watery instead of milky.

* *Platanus orientalis*.

CONVERSATION VI.

SPURGEWORT — MASTWORT — WALNUT — NUTMEG — CUCUMBER —
BEGONIA — PAPAWE — PASSION-FLOWER — VIOLET — TAMARISK, AND
HOUSE-LEEK TRIBES.

ONE day the children saw in their father's study a smooth, thick piece of wood, on which a very beautiful drawing had been made. Mary asked if she might have such a piece of wood to draw upon; but she was told that it was too expensive, and that she must be contented with paper, until she could draw in a very superior manner.

“This is the wood of the box-tree,” said her father, “and it has been prepared in this way for the use of the wood engraver, whose interesting work I will one day take you to see. Meanwhile let us talk about the tribe to which the box belongs. It is called the SPURGE tribe and many of the plants are extremely poisonous; but this does not prevent the use of several families in

medicine;* yet the fatal character of others is such that no medical man would dare to prescribe them. One foreign tree in particular, called the Manchineel, which bears a handsome, apple-shaped fruit, is so poisonous that persons are said to have died by merely sleeping beneath its shade, while a single drop of juice on the skin produces an ulcer difficult to heal."

"Do you think it can be true, papa, about people dying who sleep near it?" said Robert.

"I am not qualified to judge of its truth," said his father; "but those who are so inform me, that with so volatile a poison, it is not at all unlikely that delicate persons might die from sleeping under it, and breathing its dangerous atmosphere."

"What does 'volatile' mean?" asked Mary.

"A substance is said to be volatile," said her father, "when it easily becomes vapour and escapes into the surrounding air. Camphor is volatile; and hence its powerful odour is immediately perceived, while its very substance becomes converted into vapour."

"Oh yes," said Mary; "the piece of camphor I put with my dried plants has entirely wasted away."

* Euphorbia, Mercurialis, Croton, &c.

Robert said that smelling-salts must be very volatile, for when he left the stopple out of mamma's smelling-bottle, all the scent and the salts too went quite away in a few days.

"British Spurgeworts," said his father, "are remarkable for the singular structure of their green flowers, and for an acrid milky juice, which burns the tongue and throat. The unripe seeds of one species are pickled instead of Capers, but they form a dangerous substitute. The Wood Spurge* is a common shrubby plant, two feet high, with golden green leaves and flowers, and having in autumn a red tinge on its stems and leaves.

"Another very poisonous spurgewort," said his father, "is the common mercury,† which grows in bushy and shady places, and flowers in April and May. This insignificant-looking plant has produced convulsions and death, so that I must again warn you against chewing any leaves, roots, or berries of strange plants. Yet happily in this, as in most poisons, the taste is so nauseous and burning, that there is little temptation to transgress."

"Is there anything poisonous about the box-

* *Euphorbia amygdaloides*. † *Mercurialis perennis*.

WOOD SPURGE.

tree itself?" asked Mary, "because I often gather the little curled-up leaves to make cups and saucers for my dolls."

"And you would not like them to drink out of poisoned cups," said Henry, laughing.

"The leaves are very bitter," replied her father, "and it is said that in those parts of Persia where box-trees are common, it is impossible to keep camels, because the animals cannot be prevented from browsing on the leaves, which kill them; yet, on the other hand, we find that box-leaves have sometimes been used instead of hops, to give a bitter flavour to beer. The juices of plants of this tribe must not, however, be all condemned as injurious. The juice of a spurge* inhabiting Guayana and Brazil yields the bottle India-rubber which we are all familiar with."

"Will you tell us how those bottles are made, papa?" said Mary.

"They are made on clay moulds, which the natives smear over with repeated layers of the juice, drying it in the smoke. But we must pass on to mention two small tribes, one of which, as its only British specimen, contains our common crow-

* *Siphonia elastica*.

berry,* while the other has the remarkable growth which you have seen represented in the pitcher-plant.† We now rise to a higher group, and you need only look round this room to see specimens of the most important member of it."

The children did not see at first what their father meant, but Henry soon recollected that the old carved oak, of which the bookcases were made, must be the specimen.

"You mean the good old English oak, papa," said he. "The wooden walls of old England are made of it, so we ought always to admire the oak." Henry here had to explain to his brother and sister, that by wooden walls he meant the ships which protect our island; and his father told him that although the oak is chiefly employed in ship-building, and is called the 'shipwright's treasure,' yet other timber is also used, especially teak, a fine timber which abounds in the East Indies.

Mary said that she remembered several other uses of the oak, besides ship-building. "The gall-nuts are used in making ink, the bark for tanning leather, and the saw-dust for dyeing, besides the acorns being used for feeding pigs."

* *Empetrum nigrum.*

† *Nepenthes distillatoria.*

“The tribe of trees and bushes to which the oak belongs,” said her father, “has been conveniently

SPRIG OF OAK.

called MASTWORTS, because the fruit, contained in a peculiar husk or cup, is called by country people ‘mast.’”

“I have heard people talk about beech-mast,” said Robert.

“Yes, and the fruits of the hazel, the Spanish chestnut, and the oak, as well as of the beech, are

FLOWER AND RIPE FRUIT OF CHESTNUT.

all called mast. These valuable trees inhabit the

forests of the temperate zone, both in the Old and New World. Oaks and chestnuts are found on the high lands within the tropics, but are unknown on the low lands. Several species of beech flourish far south, occurring in Van Diemen's Land, New Zealand, and the lower parts of South America. The timber is equally valuable when the tree grows in warm countries. There is an astringent principle pervading the whole tribe, which is valuable in medicine. Near to these, but not belonging to Mastworts as you may know by the fruit, is the common walnut, which is a native of Persia and Cashmere, and is greatly valued in those countries on account of its oil, which is employed in cookery, and for burning in lamps."

"I did not know that there was such a thing as walnut-oil," said Mary, "until I saw it among aunt's materials for oil painting."

"Among a great number of foreign plants having a twining or scrambling habit, we find the NUTMEGS;* although these have a tree-like growth, and seem to resemble our common laurels. You remember the fruit and leaf of the nutmeg which

* Myristica.

were sent to me from the West Indies, preserved in spirit."

"Oh yes, papa," said Robert; "the fruit was something like a pear in shape, and the nutmeg was like a kernel in the middle of the pulp. What I thought the prettiest, was the red mace which was wrapped round the kernel like a coarse net. It is very odd that there should be two such different spices in one fruit. I like nutmeg very much, but I do not like mace at all."

"Perhaps you do not know that your favourite nutmeg can only be taken safely in very small quantities. Whatever the natives of India may do, it is certain that a European taking this spice in excess, would soon experience intense thirst and headache, and perhaps delirium and death. Nutmegs are tropical plants, and so are the various families composing the CUCUMBER tribe, which is the next I shall mention."

"Cucumbers grow in the open ground as well as in hotbeds," said Mary, "and for that reason I thought they were English plants."

"Vegetable Marrows and Gourds," said her father, "also grow freely in the open ground, but they are natives of hot countries, and so are

melons, and all other members of this tribe. They have a habit of climbing by means of long curling tendrils, and in the wild state several species are poisonous. Thus the pulp of the bottle-gourd* has produced symptoms of cholera, and it is recorded that some sailors were poisoned by drinking beer that had been left in a flask made of one of these gourds. The spiriting cucumber† is a virulent poison, and from its pulp is prepared the powerful drug called *Elaterium*, a few grains of which sometimes bring on symptoms of poisoning. Our common white Bryony‡ belongs to this tribe, and partakes in the same qualities."

"Is it not dangerous to have anything to do with such a tribe?" asked Mary.

"It is necessary to use the fruit cautiously," said her father; "but cultivation improves many of the species so much, that they lose nearly all their baneful properties. It would be a pity to give up our acquaintance with melons, cucumbers, and vegetable marrows because some of their uncultivated relatives are dangerous characters. Indeed, we are not at liberty to despise even these

* *Lagenaria vulgaris*.

† *Echaliium agreste*.

‡ *Bryonia dioica*.

dangerous plants, for several valuable medicines

WHITE BRYONY.

are obtained from them, especially Colocynth.*

* *Cucumis colocynthis*.

The seeds of most of them are mild and harmless. In an African species* these seeds, when ripe, are as large as chestnuts, and resemble almonds in flavour, yielding also an abundance of oil. The pulp of the same fruit is excessively bitter, and produces violent headache when only applied to the tongue."

Henry thought it very odd that the seed should be wholesome and the pulp poisonous, which is the case with nearly all the plants of this tribe. He was told that the BEGONIAS of our conservatories, whose red-veined leaves are so much admired, and whose whole foliage is sometimes of a deep rose colour,† are not far removed from cucumbers, and that some of the species have the same scrambling habit.

"Allied in many respects to cucumbers, is a strange and remarkable tribe of South American plants, of which we will take the PAPAWE as an example. This extraordinary tree has the property of making the toughest animal substances tender, so that newly-killed meat, when hung amongst its leaves, becomes fit for cooking in a few hours."

* *Telfairia pedata*.

† *Begonia sanguinea*.

"What a convenient tree that would be for our kitchen garden!" said Mary.

"Still more strange is it," continued her father, "that old hogs and poultry, when fed on its leaves, become also tender, and fit for the purposes of the table, in the course of a few hours."

"We really ought to have it in England," said Henry. "If it would not bear our cold winters, we could keep it in a hothouse, and it would be worth the trouble."

"Perhaps its curious properties would be lost under artificial cultivation," said his father; "and at any rate there would be disagreeable effects to set against the convenience of having such a tree."

"How so, papa?"

"The roots of this tree have a most disgusting and overpowering smell, like decaying animal matter, and the blossoms also have a disagreeable odour. The juice, when analysed, greatly resembles animal albumen, dissolving like it in water. *Fibrin*, a principle which is considered peculiar to the animal kingdom, is found in this tribe, and also in the fungus tribe, which causes both tribes to be peculiarly interesting to those who love to

search out the wonders and difficulties of the vegetable world. These papaws are, indeed, so unaccountable in their properties, that I should have hesitated to tell you about them, except on the best authority. Remind me to give you their history at greater length from Hooker's account of them in the *Botanical Magazine*."

"Thank you, papa, I shall not forget it," said Henry.

His father now began to speak of that beautiful tribe of climbing plants called the PASSION-FLOWER tribe.

Mary said she knew why they were called passion-flowers, for her mamma had shown her all the parts of the flower, which were supposed to represent the instruments of our Lord's passion or sufferings.

"There were the three nails in the centre," she said, "and round them the five wounds, and outside them the crown of thorns, with the upright column in the middle, for the pillar of scourging."

Robert said he did not understand how three nails could make five wounds; but his sister reminded him that one wound was from the soldier's spear, and also that, in crucifixion, the feet

were usually crossed, and one nail driven through both, so that the four wounds of the hands and feet might be made by three nails. The children were talking thus in a low voice, on the solemn subject of our Lord's crucifixion, when their father told them that the idea of connecting the passion-flower with that awful event was adopted by some zealous Roman Catholics, when they first saw these splendid plants blossoming in their native woods, and climbing about from tree to tree in wild magnificence.

"And where are their native woods?" asked Henry.

"Chiefly in South America and the West Indies, where the fruit of some species is eaten, and where infusions of the flowers are used as a remedy for coughs, and a poultice of the leaves is used to subdue erysipelas and other eruptions on the skin. It would not be safe, however, to employ the passion-flower for such purposes in this country, as the tribe possesses active and dangerous qualities."

"At this part of the vegetable kingdom we must pass over several tribes of plants, natives of hot countries, only mentioning a familiar species,

called the Arnotto plant,* whose orange-coloured waxy pulp, when separated from the seeds and

ARNOTTO PLANT.

dried, forms cheese-colouring, and is also used in the preparation of chocolate. We next pause at

* *Bixa orellana*.

the VIOLET tribe, which, besides our sweet violets,* dog-violets,† and pansies, contains also many

DOG-VIOLET AND SWEET VIOLET.

foreign herbs, emetic in their properties, and known to us under the name of Ipecacuanha. The roots

* *Viola odorata*.

† *V. canina*.

of our sweet violet have similar qualities, and the petals and seeds are likewise medicinal.

Henry remembered reading that violet flowers were made into wine by the Romans, and also that they are still used in the East to make sherbet. His father told him, that this tribe does not consist wholly of small herbs, such as our own violet, but that some of the foreign families are berry-bearing shrubs, and one has a twining stem.*

"Do you remember, Mary," said her father, "the beautiful shrubs which fenced some of the gardens at Shanklin, when we last visited the Isle of Wight?"

"Oh yes, papa; they were the prettiest I ever saw, with very slender branches like beautiful smooth rods, and covered with tiny leaves of a bright green. I was surprised to see them growing so close to the sea."

"I remember them," said Henry; "they were something like young withy bushes, only the leaves were smaller and brighter, and the stems were red. They grew along the edge of the sea-wall, and in winter I should think they were often washed by the tide."

* *Corynostylis*.

BLOSSOM OF THE TAMARISK.

“They are tamarisks,” said his father; “and their natural place is by the sea-side, although they are occasionally seen on the brink of rivers and torrents. Their bark is bitter and astringent, and the galls of some species are used in dyeing. One species* bears a sort of manna, but this appears to ooze from the tree, in consequence of injuries by an insect† inhabiting it. The flowers of the tamarisk are in close spikes, and altogether it is one of the prettiest of shrubs. All the species are confined to the Northern hemisphere, and even to its Eastern half. Our next tribe will be a more familiar one; for there is scarcely an old moss-grown cottage or wall in the village on which you may not find a specimen of the HOUSELEEK tribe.”

“There is a beautiful one,” said Mary, “among the moss on the thatched shed over the saw-pit. It has fleshy leaves spreading out and fringed all round; and last summer there was a handsome bunch of rose-coloured flowers on a tall stem in the middle. And this stem had a great many leaves upon it, but they were small narrow ones, very different from those at the root. How much I wished for that beautiful blossom! I asked the

* *Tamarix mannifera*.

† *Coccus manniparus*.

sawyers to get it down for me; but they were so busy at their work, that they did not attend to me."

"Of course not!" said Henry. "You should have asked me to climb the shed, as I did the garden wall, when you wanted a heap of yellow stonecrop that was growing there."

"The different sorts of stonecrop* are members of the houseleek tribe," said his father, "as well as the common houseleek,† which Mary has been describing. There is also the Mossy Tillœa, or Red-shanks, with red creeping stems and white flowers, common on the sandy heaths of Norfolk and Suffolk; and there is the Navelwort, with purplish stems and pale-yellow flowers. All these and many foreign species make up a tribe, interesting in its hardy habit and power of growing almost without any soil. They are found on naked rocks, sandy plains, and spots where not a blade of grass will grow."

"I have often wondered," said Mary, "how the stonecrop could live upon a wall where there is no earth for it, and where on sunny days it is so hot that I can scarcely bear my hand upon the bricks."

"These plants get their nourishment chiefly

* Sedum.

† Sempervivum.

from the air, and are covered with little pores or mouths, invisible to the naked eye. Some of the species, when boiled in milk, are eaten by country people, and are considered cooling and wholesome. The Greenlanders use one of the tribe* as food; but the common biting stonecrop, or wall-pepper,† which is so abundant in this neighbourhood, acts on many constitutions as an emetic. It is with the fresh leaves of a houseleek‡ that the fishermen of Madeira rub their nets, which are thus rendered as durable as if tanned, being also steeped in some alkaline liquor."

"It is a good thing that some of the houseleeks are wholesome," said Robert, "because they grow where nothing else can grow; and I dare say the poor Greenlanders are very glad with vegetable food, and so must the people be who have to cross sandy plains and deserts."

"It is a wonderful provision of the Almighty," said his father, "that these humble plants should be able to bear the extremes of heat and cold, and to flourish in situations where our hardiest mosses would be destroyed."

* *Rhodiola rosea.*

† *Sedum acre.*

‡ *Sempervivum glutinosum.*

CONVERSATION VII.

CISTUS—CRUCIFEROUS—MIGNONETTE—COTTON—NASTURTIUM—
LIME—MILKWORT, AND SOAPWORT TRIBES.

AMONG Mary's dried plants were some blossoms of the Gum Cistus, that handsome shrub which drops its large white crumpled flowers almost as soon as they appear, but sends forth also every day others to take their place. Mary had collected a number of the fallen blossoms during the previous summer, and her father now called for them as an example of the CISTUS, or ROCK-ROSE tribe.

"These plants," he said, "are some of the most elegant and fragrant in the South of Europe, where they abound in woods and among rocks. But we have a few of their relations growing wild in our own woods, and one of them is the yellow flower that Mary admired so much on yonder hill-side, last July."

"You mean the pale-yellow flower, that I mistook at a distance for a buttercup; but it was much more delicate, and the blossom was a little

COMMON ROCK-ROSE.

crumpled, and easily fell off. The stem was woody, like a little shrub, and the leaves were white underneath."

"That is the common rock-rose,* and there are others of its family with which you may one day make acquaintance; such as the hoary dwarf rock-rose of the North of England, and the white mountain rock-rose, which grows in some parts of Somerset and Devon. I am not aware of any useful qualities ascribed to these plants, therefore I leave them for a most important and highly useful tribe called the CRUCIFEROUS tribe."

"That must have something to do with 'a cross,'" said Henry. "Is there any fancy about them, such as there is about the passion-flower?"

"No; but each plant is actually a 'cross-bearer,' as its name implies, for the flowers of the whole tribe are in the form of a cross."

"What an odd shape for a flower?" said Mary; and she tried to recollect seeing one, but in vain, until her father explained that he meant that sort of cross, called the Maltese cross, in which the limbs are all equal. Then she quickly remembered, that the common single wallflower has four

* *Helianthemum vulgare*.

petals opposite each other. in the shape of a Maltese cross.

“And so has the stock, and the rocket, and honesty,” said Robert; “and they all grow in my garden.”

BLOSSOM OF THE WALLFLOWER.

“And so has watercress,” said Henry, “and cabbage and turnip, and a great many useful things. I have often noticed their flowers being all of the same shape, but I did not know they were cross-bearers.”

“These flowers are like us,” said Mary; “for mamma has told me that every one, even a little child, has a cross to bear.”

“What does mamma mean by that?” asked Robert.

“She means, that we have things to disappoint us and make us sorry, and things to tease us and make us angry, and that we must learn to bear them all without being fretful or unkind. This is what mamma calls taking up our cross.”

“It is very difficult to help being angry when you are teased and worried,” said Henry.

“Then take care you never tease and worry other people,” said Mary. “I shall always fancy,” she continued, “that these cross-bearing plants are very patient, mild, amiable flowers, that will not do harm to any one.”

COMMON HEDGE-MUSTARD.
(*Sisymbrium officinale*.)

“In some respects, you have guessed their qualities well,” said her father; “for it is a fact

that they do no harm to any one, but on the contrary are many of them very wholesome and valuable vegetables: such as the cabbage, which you see in all the cottage gardens of our village, and the turnip, whose benefits to our flocks, and indeed to our whole system of farming, are almost endless. Sea-kale, rape, mustard, cress, radish, and water-cress, are also valuable members of this extensive tribe, which is not only of use in this way, but in furnishing oil from the seeds. Rape-oil is in very common use, and the crushed seeds, or refuse from the oil, make the well-known oil-cake used in fattening cattle. Thus you see, that cruciferous plants have a very important office in the world, while they are so easy to be known, that there is not much danger of mistaking them. If you were to be shipwrecked on an uninhabited island, and were to find a cross-bearing plant, you need not fear to eat it, although it might not be known to you."

"Is there no other flower that I might mistake for it?" asked Henry.

"There are other flowers with four petals, which, by a very careless observer, might perhaps be taken for cruciferous flowers; but not by any

one who has examined them well. You know what I mean when I speak of the *stamens* of a flower, and you will always find in these flowers six stamens, two of which are constantly shorter than the other four. But in order to fix the memory of these important plants, run into the garden for a sprig of early winter cress, which is now in blossom, or look into the meadow beyond for a cuckoo-flower."

SHEPHERD'S PURSE.
(*Thlaspi bursa pastoris*.)

The children all ran off to execute this welcome commission, and Mary was the first to espy a cuckoo-flower, or at least, its near relation, the hairy cardamine;* for the real cuckoo-flowers,† or

"Ladies' smocks, all silver white,
That paint the meadows with delight,"

* *Cardamine hirsuta*.

† *C. pratensis*.

were not yet in blossom. Robert also brought a small plant of shepherd's purse, which he had pulled up in haste, root and all, because he saw that its tiny white flowers were cross-shaped, and

COMMON WHITLOW GRASS.
(*Draba verna*).

Henry had dug out from the garden wall an entire specimen of Whitlow grass, which is one of our smallest flowering plants, and a very pretty one too, when closely examined.

"If you want another mark of this tribe besides that of the cross-shaped blossoms," said their father, "take notice of the seed-vessel, which is either a long pod, as in the cardamine, or a short pod, as in shepherd's purse. If you open one of the pods, you will see that it has a partition of thin membrane down the middle."

"In this cardamine," said Mary, "there are pods with the two sides curled up, and the partition standing alone."

"That is the way in which the seeds are dispersed, when they are fully ripe; the elastic

valves burst away, carrying the seeds with them. In some cases the pods end in a sharp point called *the beak*, as in charlock; and if you have ever seen the white salad mustard when it has run to seed, you must have noticed the sword-shaped beak in which the pod ends. There are no seeds in these beaks."

"I think I shall always know one of these cross-bearing plants when I see it," said Mary.

"A third mark, which may help you," said her father, "is this; most flowers have two little leaves called bracts, very different from all the other leaves, and situated a little below the blos-

HAIRY CARDAMINE. (*C. hirsuta*.)

som, either on the flower-stalk, or at its base ; but in cruciferous plants, these bracts are always absent."

FIELD MUSTARD, OR CHARLOCK.
(*Sinapis arvensis*.)

"But there are leaves on the stem of the shep-

herd's purse very different from those at the root," said Henry.

"True; and that is very common; but bracts belong especially to the *flower-stalk*, not to the general stem, and are very different from these."

"Then if I find a flower in the shape of a cross, and having pods with a partition down the middle,

SWORD-SHAPED BEAKS OF THE SEED-PODS OF WHITE MUSTARD.

and netted veined leaves, and no bracts, I may be quite sure it is one of these Crucifers, and safe to eat, if I cannot get a better salad," said Henry.

"Certainly: but as your observations may not be at first correct, I advise you to bring your salad to me before you eat it."

Mary remembered that in looking for shepherd's purse for her bird, she had once found a plant very much like it, but with larger and rounder pods. Her father thought from her description that it

must have been penny cress,* so called from the seed-vessel being about the size of a silver penny.

SEED-VESSEL OF
PENNY-CRESS.

“In leaving these interesting plants,” he said, “which have detained us longer than usual, I must mention one that has been the subject of superstition. It is called the Rose of Jericho, and has the curious property of contracting its branches into a ball. In this state it is caught up by the wind of the Egyptian deserts, where it grows wild, and is hurried from place to place. On being put into water, however, it revives, and spreads out in its natural form. One of the old legends states, that this plant first bloomed on Christmas eve, to celebrate our Saviour’s birth, and remained in blossom till Easter, to do homage to his resurrection. But let us now proceed to the next tribe, which is MIGNONETTE, consisting of weeds only, but one of these so fragrant, that it is admitted into our gardens. Lindley calls these plants Weldworts, from one of them, called Weld, which yields a yellow dye.”

Mary scarcely liked to hear mignonette called

* *Thlaspi arvense*.

a weed; but her father passed on to notice the CAPERS, from the flower-buds of one of which we get our well-known pickle. He said that the

COMMON MALLOW.

qualities of this tribe resemble those of Crucifers, but are more powerful; and that the plants are

very common in tropical countries, without being so generally useful as Crucifers are to us.

“We now come to several tribes, more or less nearly connected with our common MALLOWS,* but as some of them are wholly tropical, and have very ‘hard names,’ I must select particular families for notice, such as the noble-looking cotton-trees†

THE COTTON PLANT.
(*Gossypium*.)

of the East and West Indies, whose seeds are wrapped up in a woolly substance, which is not, however, the true cotton of commerce, this being

* Malva.

† Bombax.

obtained from several species of the shrubs called cotton plants,* also inhabitants of the same countries, and belonging to a neighbouring tribe. Also the useful trees which produce the seeds called cacao, or cocoa, the chief ingredient in chocolate."

"I used to be puzzled about cocoa," said Henry, "fancying that it came from the cocoa-nut palm."

"It is obtained from a small tree,† of which there are extensive forests in Demerara. The pulp which surrounds the seeds is distilled into an ardent spirit. A neighbouring tribe to this is the NASTURTIIUM tribe, consisting wholly of North and South American plants."

"I fancied," said Mary, "that nasturtiums were poisonous; it was their strong smell that made me think so; but mamma says that the seeds are often pickled and used instead of capers."

The children were surprised to hear that the next tribe to this was the LIME tribe, and that only a small number of these are forest trees, while the great proportion are weed-like plants or shrubs, or small trees found within the tropics, and resembling, in many respects, our common mallows.

* *Gossypium*.

† *Theobroma cacao*.

"I am now going to describe a group consisting of many separate tribes and families, but all in some measure connected by certain botanical characters, one of the most evident of which is that they all have irregular flowers."

"How do you mean, papa?"

"I mean, that instead of the petals being of a regular and uniform shape, such as in Crucifers and others, they are by no means uniform, some of the petals being fashioned into little hoods or fringes, or in some way differing from the rest."

"Then I am sure the little blue milkwort,* that we found on the hill side, ought to be one of them," said Mary; "for when mamma took off the petals to show us its curious shape, there was a pretty little fringed hood to shelter the stamens."

"And it does, in fact, belong to this group, giving its name to the MILKWORT tribe. Our little milkwort was so called because it was supposed to improve the milk of cows that fed on it, and it has also the reputation of being useful in diseases of the lungs. Another species,† however, contains far more of the bitter principle which has gained

* *Polygala vulgaris*.

† *P. amara*.

this reputation. Some of the foreign milkworts furnish dyes, and one is soapy in its nature; so that the bark of the root, merely agitated in water, produces a froth; or it may be pounded and made into washballs. With these the ladies of Peru are said to wash their beautiful hair, while the silversmiths employ them in cleansing and polishing their goods. And this soapy quality prevails so much in another tribe as to give the name of SOAPWORTS.* The fruit of several of them lathers freely, and one especially is used in the West Indies instead of soap; it is said to cleanse more linen than sixty times the same weight of soap would do."

"How convenient it would be to have one of the soapworts growing in our garden!" said Mary.

"We have one of them," replied her father; "but it possesses this quality very faintly, and only in the seeds. The horse-chestnut† is the one I allude to; but I have never heard that the soapy quality of its seeds has been made useful in any way, although it doubtless imparts the richness to them which, in Switzerland, causes them to be valued for fattening sheep."

* *Sapindus saponaria*.

† *Æsculus hippocastanum*.

“I was told not to eat horse-chestnuts, because they are hurtful,” said Robert.

LEAF AND FLOWER-BUDS OF THE HORSE-CHESTNUT.

“They are neither wholesome, nor agreeable : even with the Genevese sheep, the fruit is crushed and given cautiously in small quantities. Several of the soapworts are dangerous plants; and in

Brazil the Blacks prepare a poison from one of the species, which slowly, but certainly, destroys life. Not far from the horse-chestnut, but with sugary properties, instead of soapy, is the MAPLE tribe, from the sap of some species of which sugar is obtained in abundance."

"Maple-leaves are very pretty," said Mary, "they turn to a bright yellow in autumn, with specks of red and brown."

"That is the Lesser Maple," said her father, "which is scarcely ever seen as a tree, but is cultivated as a hedge-row bush, for which it is well fitted by its rapid growth. But the Greater Maple, or Sycamore, is a very fine tree, and grows like a weed in this country, although it is not a native."

"A number of young sycamores are coming up in my garden," said Henry. "The winged seed-vessels (which we call bunches of keys from their odd shape) are blown by the wind from the large sycamore in the paddock; and the seeds take root easily in my flower-beds."

"Is there any sugar in our sycamore?" asked Robert.

"Sugar has been obtained from the sap of the sycamore, and the blossoms so abound in honey

that it is a favourite tree with bees ; but it is from a North American species * that maple-sugar is obtained in sufficient quantities to reward the manufacturer."

"You have told us of several plants which produce sugar," said Henry : "but when shall we come to the tea-plants?"

"I am just going to introduce you to the group to which they belong, and which includes tribes of various growth ; but most of them remarkable for producing abundance of resin."

"I have read an account of the tea-plant," said Mary, "and they say it is about the size of a gooseberry bush."

"Then I fear," said her father, "that you have so connected it with a gooseberry bush in your mind, that I shall not be able to give you a true idea of the plant until we visit some botanical garden where a specimen may be seen."

"The leaves are like gooseberry leaves, are they not, papa?"

"Go and ask for some tea-leaves in the kitchen, and examine for yourself," said her father.

Mary soon brought some damp tea-leaves ; but

* *Acer saccharinum*.

in spreading them open, she found that there was scarcely one in a perfect state, but all looked as if they had been cut in small pieces. Yet, after some search, she found one less injured than the rest, and was surprised to see that it was a long smooth leaf, pointed at the end, and slightly notched at the edges. "This is more like a small laurel leaf, or bay leaf," said she, "than it is like a gooseberry leaf."

"Exactly ; and when you see the TEA plant,* you will say it is like a young laurel bush, or rather like a *camellia japonica*, which, indeed, is its near relation, and belongs to the same tribe."

"Are those beautiful camellias of any use?"

"An excellent table-oil is extracted from the seeds of one of the camellias,† but I believe the chief use of which we are aware, is the beautifying of our houses and conservatories by the rich red or white blossoms of the flowers. Not far from the camellias is a tribe of plants yielding gums and resins, which also contains the mangosteen,‡ said to be the most delicious of all fruits."

"What is it like?" asked Robert.

* *Thea viridis*.

† *Camellia oleifera*.

‡ *Garcinia mangostana*.

“In size it resembles an orange, and it is filled with a very sweet and delightful pulp. It thrives greatly in the hot, damp atmosphere of Malacca. The same tribe produces the Mammee Apple or Wild Apricot of South America, which is said to rival the mangosteen. From some member of this tribe also comes the acrid yellow gum known in commerce as *gamboge*.”

“I have some in my paint-box,” said Robert.

“I must now recall to your recollection the different kinds of ST. JOHN’S WORT that frequently enliven our hedge-rows and pastures with their yellow blossoms about Midsummer-day (the feast of St. John). Also that interesting plant called Grass of Parnassus, which is less common here, because we have not much of the boggy soil in which it delights.”

“But these are not gummy plants, are they, papa?” said Henry.

“They are not, or at least their properties are not developed in this climate; but some of their American relatives yield a sufficient quantity of gum to make them known in commerce, while others, and even some of our own species, have been used medicinally. And now I will conclude

this conversation with a few words on WATER LILIES, which, with some foreign plants called

ST. JOHN'S WORT.

Water Shields, and Water Beans, form the next tribes."

Mary had heard her mamma call the white water-lily the queen of British flowers, and she now learnt that in botanical language it is named after the water-nymphs which were fabled to inhabit streams. Both the white water-lily* and the

THE WHITE WATER-LILY.

yellow water-lily† grew in a slow-running river not far from her home, and she naturally thought them the most beautiful of all water plants; but her father now told her that in South America

* *Nymphaea alba.*

† *Nuphar lutea.*

there is a splendid plant resembling our water-lily, but of such enormous size, that people take a boat and row round it in order to examine its leaves and blossoms. “This beautiful and extraordinary flower,” says he, “measures more than a yard in circumference, and its leaves are two yards wide. The plant has been named *Victoria Regina*, in honour of our queen. In South America it is called Water Maize, the seeds being eagerly sought after in times of scarcity by the natives, who use them either boiled or raw.”

CONVERSATION VIII.

RANUNCULUS—POPPY—FUMITORY—SUN-DEW—BARBERRY, AND
VINE TRIBES.

THE pastures now began to be sprinkled with buttercups and marsh marigolds, and the banks with the little starry celandine, so that the children were able to mix those showy yellow blossoms with the budding hawthorn, and the pale cuckoo-flowers, which they gathered for the 1st of May. There was a rustic seat under an old acacia on the lawn, and when their mamma came down to breakfast on an unusually warm May-day, she found the young folks adorning this seat with hawthorn boughs, and hanging wreaths on the rugged trunk of their favourite tree. The prettiest of these wreaths was offered to mamma, and Mary was delighted to hear it very much admired, and to see her mamma wearing it as a trimming to her bonnet, when they walked through the village that morning. The little girl also had plenty of May blossoms in her large straw hat, and the village

children were carrying about hoops made of withy, and loaded with marsh marigolds, or else they

THE SMALL CELANDINE, OR PILE WORT.
(*Ficaria verna*.)

carried sticks with a few flowers tied to the top, making a shabby kind of May-pole.

“What a pleasant May-day,” said Mary, “and how gay the meadows look with buttercups!”

“All the flowers you call buttercups,” said her father, “belong to the *RANUNCULUS* tribe, the word being formed from the Latin for a frog (*rana*). Can you guess why they are so named?”

CREeping CROWFOOT.
(*Ranunculus repens.*)

Robert guessed that it was because frogs are yellow; Mary guessed that it was because they have bright eyes; Henry guessed that it was because they are fond of damp places. And Henry was right.

“Buttercups, larkspurs, columbines, anemones, hellebore, monk’s-hood, pæony, pheasant’s eye.

herb-Christopher, clematis, and others, which belong to this tribe, all prefer a cold, damp climate, and it is very seldom that any of them are met with in the tropics, except on mountains."

FIELD LARKSPUR.
(*Delphinium consolida.*)

ENTIRE-LEAVED PÆONY.
(*Pæonia corallina.*)

"Some of them are poisonous, are they not, papa?" said Mary.

"All of them are suspicious, and some are violent poisons. If you were to gather buttercups for an hour or two, you would most likely find

your little hands blistered, especially if you met with two kinds of buttercup which are noted for producing that effect.* If you were to chew the

HERB-CHRISTOPHER, OR BANEBERRY.

MONK'S-HOOD.
(*Aconitum napellus*.)

leaves or blossoms of the monk's-hood, you would soon become dangerously ill."

"Monk's-hood and larkspur are not at all like buttercups," said Henry; "why are they put in the same tribe?"

* *Ranunculus flammula*. *R. sceleratus*.

“Their flowers are not alike, but their qualities are similar, and the arrangement of their seed-vessels is the same. Examine the carpels or seed-vessels, and the stamens growing from beneath them in the buttercup, and you have the key to the relationship, although there are many trifling differences. Some of the foreign tribes related to ranunculus produce splendid flowers, especially the Magnolia tribe, which contains some of the finest trees and shrubs in the world. The poppy tribe also claims relationship with ranunculus: but its juices are milky, instead of watery, and the seed-vessels are not distinct, but grow together into one head.”

“Oh, yes,” said Robert, “I know what poppy-heads are, for I helped mamma to shake the seeds out from those we had in the garden last summer.”

• “And mamma says that the Great Celandine, which grows in hedges, and has those bluish leaves, is related to the poppies, and is poisonous,” said Mary.

STAMENS GROWING FROM
BENEATH THE CARPELS.

POPPY-HEAD.

COMMON CELANDINE. (*Chelidonium majus.*)

“It is so, and you might guess it by the strong odour of the plant, and of the thick yellow juice which runs from it when you break the stem. It is well to notice this particularly, because the pod which follows the flower is not much unlike that of a cruciferous plant, and it might be fatal to mistake one for the other. The beautiful Escholtzia of our garden, and the yellow-horned poppy we saw at Brighton, also have long pods, but no one could reasonably mistake them for crucifers.”

Henry asked if opium was not obtained from the white poppy, and his father replied in the affirmative, telling him at the same time, that in the case of this drug, men have turned a blessing into a curse. The children wondered how opium could be a blessing to any one, until they were told that medical men use it to subdue pain and convulsions, and that

YELLOW-HORNED POPPY.
(*Glaucium luteum*.)

it is only by the evil passions of men that it has been diverted from its proper use, and has been

COMMON FUMITORY. (*Fumaria officinalis*.)

made a means of destruction to mind and body. Henry had read an account of the fatal condition

of opium-eaters, and he was not surprised to hear his father speak strongly of the vice and misery of those unhappy persons.

As the children proceeded on their walk, they found, in the loose soil at the hedge of a corn-field, an elegant little plant which they knew well, but which they had seldom seen in blossom quite so early. It was the common fumitory, with rose-coloured blossoms, tipped with purple.

“What a dear little flower this is,” said Mary, “to come out in May, and keep on blowing till November !”

“The FUMITORY tribe,” said her father, “is not far removed from poppies, and your favourite plant was once in great request among superstitious persons, because the smoke of it was declared by the ancient exorcists to have the power of driving away evil spirits. Hence the name *fumitory*, from *fumus*, smoke. Close upon this tribe come the SUNDEW, the BARBERRY, and the VINE tribes.”

At the name of sundew, Mary, who generally had a scrap of poetry connected with her favourite flowers, began thus :—

“By the lone fountain’s secret bed,
Where human footsteps rarely tread,
Mid the wild moor or silent glen,
The *sundew* blooms unseen by men.”

“Do not repeat any more,” said Henry, “unless there is anything said about the leaves being fly-

ROUND-LEAVED SUNDEW. (*Drosera rotundifolia*.)

traps. I know there are little hairs all round

the leaves, and that insects are caught in them, and cannot get away because they are so gummy."

"Of course there is nothing said about that in poetry," said Mary.

"Well then," said Henry, "I had rather talk about the barberry, and the vine, and their nice fruit. What a beautiful barberry bush that is in the Rectory Garden! In the spring there are the long strings of yellow blossoms hanging down, and in autumn the bright red berries like clusters of coral."

The stamens of the barberry grow from beneath the oblong seed-vessel, which is afterwards the berry, and in the full-grown flower they always lie opposite the petals. These stamens are curious, for in the little knob at the top

COMMON BARBERRY.
(*Berberis vulgaris*.)

of each, called the *anther*, there are two little trap-doors opening backwards, to disperse the *pollen*, or seed-dust.

STAMENS OF THE
BARBERRY.

BLOSSOM OF THE
BARBERRY.

ANTHER OF THE
BARBERRY.

The vine tribe is much more important, yielding fruit that is delicious, whether fresh or dried, and which makes a great variety of wines. Raisins and currants are very important as articles of commerce.

Mary remembered her mamma saying that currants are the dried fruit of a vine bearing small black grapes, which used to be called "corinths," because the vine grows plentifully near Corinth; but people have gradually changed the name into "currants."

Her father remarked that the vine has a peculiar interest to Christians, because our Lord and Saviour employed the vine and its wide-spreading

branches as an image of the union between Himself and His people. At family prayers that evening the children were again reminded of this blessed union, for their father read the fifteenth chapter of St. John, which begins with the words, "I am the true vine, and my father is the husbandman."

CONVERSATION IX.

HEATH — RUE — FLAX — BALSAM — GERANIUM — WOOD-SORREL —
CLOVE — BUCK - WHEAT — GOOSEFOOT — LEGUMINOUS, ALMOND,
APPLE, AND ROSE TRIBES.

ONE day the children saw a villager mending the thatch of his cottage, not with straw, but with heather, which their father explained to them to be the elastic tufts of the common ling, a plant that covers a large extent of open country, especially in the north, and affords both food and shelter to abundance of grouse. Mary had a few dried branches of the three plants of the heath tribe which are common in this country, and these were the common or fine-leaved heath,* with very thick clusters of purplish flowers, and little tufts of smooth leaves arranged three together on the stem,—the cross-leaved heath,† with a small tuft of rose-coloured flowers quite at the top of the stem, and fringed leaves four together on the stem—and the common ling,‡ which grows to a much larger size than the others, and has pinkish flowers scattered along the whole stem.

* *Erica cinerea.*

† *E. tetralix.*

‡ *Calluna vulgaris.*

"These are very pretty plants," said her father; "but they are not to be compared to the foreign heaths, of which we see beautiful specimens in conservatories. There are many other plants included in the HEATH tribe, which you are perhaps little accustomed to consider as relations of our humble ling; for instance, the Arbutus, the Rhododendron, the Azalea, and the Kalmia,—all great favourites of yours, and very many more that remain unknown to you, being confined to the tropics. Some of the families bear succulent berries, which are not unpleasant to the taste, and are occasionally used as food. The arbutus, so common in our gardens, bears tempting-looking

CROSS-LEAVED HEATH.

strawberry-like fruit ; but this is so little palatable that it has given the specific name of "*unedo*,"

THE STRAWBERRY TREE.
(*Arbutus unedo*.)

"one I eat," to the shrub. The fruit of several North American families is more grateful, and the snow-white berries of the wax-cluster,* which grows freely in Tasmania, are said to be by no means unpleasant. The narcotic qualities of many of the tribe, however, render it dangerous to eat their fruit indiscriminately. But I must

now proceed to several important tribes, having a bitter principle common to all."

* *Gaultheria hispida*.

“Are they British plants?” asked Henry.

“Very few of them; but we can find an example in our common rue, which, you know, is bitter enough.”

“They must be disagreeable tribes if they are like rue,” said Henry.

“Wait till you know what they are, before you decide against them,” replied his father. “There is the CITRON tribe, containing the orange, lemon, shaddock, lime, citron, &c. These trees are mostly natives of the East Indies, but have spread thence to other tropical countries. Not only are the fruits delicious; but the flowers are beautiful and fragrant, and the wood is hard and compact. The orange-tree, when flourishing in a favourable soil and climate, produces an enormous quantity of fruit. It is stated that a single tree at St. Michael’s has been known to produce 20,000 oranges fit for packing, exclusively of the damaged fruit and waste.”

“No wonder that oranges and lemons are so plentiful and so cheap,” said Henry; “but one is sweet and the other sour, and neither is bitter.” His father reminded him that the rind of the orange and the seeds of the lemon are powerfully bitter;

and that the wood is also intensely bitter in most of the families.

“In one of the neighbouring tribes,” continued his father, “we have myrrh and frankincense; in another mahogany* and other fragrant woods; the whole tribe consisting of trees with compact, scented, and beautifully-veined timber, the bark of several of which has been used successfully in India in the cure of fever. Not far from these are trees abounding in an acrid, resinous, and sometimes highly-poisonous juice, which represent a tribe, chiefly tropical, in which we find the cashew-nut, the pistachio-nut, and the mango. The beautiful zebra-wood of the cabinet-makers; and the intensely-bitter wood called ‘quassia,’ an infusion of which is used to poison flies, and as a substitute for hops, in making beer; these belong to the following tribes, which are more or less valuable in medicine. We next come to the FLAX tribe.”

“Flax is very pretty, and very useful too,” said Mary. “I once had a plant of it in my garden, and I could hardly believe that its little delicate stems had fibres strong enough to make linen.”

* *Swietenia mahagoni.*

*If you admired a solitary plant, you would be delighted with such large fields of flax as I saw in my journey from Hamburg to Dresden. The tender green of such fields pleasantly brought back the remembrance of spring, at a time when the corn harvest was being gathered in. To the same tribe belongs a pretty little plant called Flax-seed, very delicate in its structure. The tribe consists of annual or perennial plants or even small shrubs. The tenacity of the fibre, and the oily nature of the seeds are common to them all, and make these apparently insignificant plants highly useful and important. Not far from these comes the CRANE'S-BILL or GERANIUM tribe.

FLAX. (*Linum usitatissimum*.)

Mary was well acquainted with the pretty little

wild geraniums of our hedges, especially with herb Robert,* whose rose-red blossoms peep out so pret-

FLAX-SEED. (*Radiola millegramna.*)

tily, and whose leaves and stems are all tinged with red; and are nearly as ornamental as the flowers; she also remembered the handsome purple meadow crane's-bill, the largest of all the wild geraniums;—Robert asked why mamma called all these plants crane's-bills, and he was told that they are so called from the shape of the seed-

* *Geranium Robertianum.*

vessel, which is very much like the bill of the crane.

MEADOW CRANE'S-BILL.

“Another family of the geranium tribe is called

stork's-bill," he added, "and from a similar cause."

"The geraniums of the greenhouse have seed-vessels of that shape," said Mary; "but they cannot be related to the wild ones; their flowers are so different."

"The arrangement or colours of petals are seldom of much importance in tracing the family connections of plants," said her father: "the form of the seed-vessel is of much greater consequence together with the general principle or quality which runs through the tribe. The geraniums of our conservatory* are near relations of the wild flowers of that name, and all possess aromatic and astringent qualities. These very handsome flowers grow wild in abundance at the Cape of Good Hope and in New Holland; while the damper parts of India swarm with beautiful species of the neighbouring tribe of BALSAMS, and multitudes are also found in Ceylon. Our little WOOD-SORREL† is a member of a tribe which approaches these, and is remarkable, especially in the tropical species, for the presence of oxalic acid. But we have a host of British flowers connected with the pinks

* *Pelargonium*.

† *Oxalis acetosella*.

and CLOVES of our gardens, and to these I must now turn."

"I dare say my little mountain-pink that grows on the wall is one of them," said Mary.

"Yes; and the common chickweed,* and the pretty little stitchwort,† whose white stars are

BLADDER-CAMPION.

common in hedges, and whose weak and slender stems cannot stand upright without the support of

* *Stellaria media.*

† *S. graminea.*

neighbouring plants. And all the Catchfly family, of which, perhaps, you are best acquainted with one that grows in corn-fields, called bladder-campion,* because its calyx is swelled into a bladder shape; and all the sandworts,† and the lychnis family, of which one is your favourite ragged robin;‡ and the purple corn-cockle,§ that looks so handsome, but is so little wished for by the farmer. All these belong to the Clove tribe; and I think you can hardly help noticing the family likeness amongst them. As to any quality common to all, I think they are classed more from the absence than the presence of any such: being all insipid herbs, like their neighbours the purslanes. Other relatives of theirs, forming the BUCKWHEAT tribe, have a pleasant acid in their leaves and shoots, and very bitter roots. The common sorrel and dock, as well as the rhubarb, so much used in tarts, belong to this latter tribe. Buckwheat itself is one of a very large family of plants common in hedges, ditches, and fields. Some of these plants you know under the name of snake-weed, knot-grass, *Persicaria*, &c.; and they

* *Silene inflata*.† *Arenaria*.‡ *Lychnis Flos-cuculi*.§ *Agrostemma Githago*.

may all be known by their numerous joints, which

SORREL.

gave the botanical name of *Polygonum*, or 'many jointed,' to the whole family."

"I thought buckwheat was a kind of corn," said Henry; "for it is used to feed pheasants."

"The seeds produce a wholesome meal," replied his father, "and you have tasted it in the form of 'crumpets,' which are chiefly made of it; but it is very different in growth from corn plants, which you know are grasses. Many of our commonest and most despised weeds bear close relationship to valuable plants; it is so with GOOSEFOOT, which is of the same tribe with spinach, beet, and mangold-wurzel."

There was a smile among the children when "goosefoot" was mentioned; for they remembered the trick Henry once played on his little brother, by getting him to gather a sprig of stinking goose-foot,* to examine the grayish-green, mealy-looking leaves, and calyx, there being no petals to these plants.

"Robert did not look at it long," said Mary; "but was glad enough to fling it into the sea; for it was in a field close by, that we found it."

"The worst of it was," said Robert, "that after I had washed my hands several times, I could smell the goosefoot still."

* *Chenopodium olidum*.

"I think that must have been your fancy," said his father: "but it certainly is one of the most detestable odours in vegetable nature; and I cannot wonder at your hatred of it. Some of the species, common in our own fields and waste ground, have an unpleasant scent; but it is not to be compared to that of this sea-side species, which most resembles putrid fish."

Mary wondered what could be the use of such disagreeable weeds; and her father told her that stinking goosefoot is spoken highly of as a remedy for spasmodic complaints. Robert said he thought it would stop his breath entirely to be obliged to swallow such a dreadful medicine; but he was assured that when the body is racked with violent pain, people never inquire whether the medicine is nauseous or otherwise, but gladly and thankfully receive whatever is likely, by the blessing of God, to afford them relief.

His father here passed by some foreign tribes of plants, with the mere mention of the useful pepper plants, on the one hand, and the ornamental mensesbryanthemums, on the other; "But not far from these," he said, "come a number of handsome shrubs, contained in the MEZEREUM and

LAUREL tribes; and, in the latter, many valuable species bearing camphor, or yielding spices; for instance, cinnamon and cassia."

Mary remembered that a fine piece of lace bark in the cabinet was described as being the inner-bark of a tree* of the Mezereum tribe; but she was very sorry to hear that this beautiful substance was formerly twisted and knotted into whips for the slave-drivers.

Her father remarked, that the next tribe to be noticed was so important, that it required their best attention, containing, as it did, the great host of LEGUMINOUS plants.

"And what are they?—and why have they such a hard name?" asked Mary.

"Their name is given on account of the form of the seed-vessel, which is universally a *legume*; and if you are still at a loss to know what I mean by that term, you must think of the pod of a pea or bean, for they are both legumes."

"And they both have the same shaped flower," said Mary, "for last summer mamma told me to find as many different blossoms as I could of a particular shape, which she called butterfly-shaped;

* *Lagetta lintearia*.

COMMON SAINT-FOIN.

and I remember sweet-peas, and field-peas, and beans, and vetches, and clover, and laburnum, and a great many more, had all the same kind of blossom.

“True,” said her father; “and this with the pod will be sufficient to mark most of the leguminous plants you are likely to meet with. But there are others of this vast tribe that have indeed the same pod, but a very differently shaped flower. Thus, the mimosas in the conservatory, whose blossoms seem little more than a bundle of delicate yellow stamens, are members of this tribe, as are all the beautiful acacias, their relatives, which yield various gums, tanners’ bark, and dark-coloured wood for furniture. The rosewood of commerce is the timber of a mimosa of the forests of Brazil, which when fresh has a faint smell of roses.

“I have thought of two more plants that have blossoms and pods like the pea,” said Robert; “and they both grow on our down, and they are both yellow.”

Henry guessed immediately what they were; namely, the furze and the broom;* and Mary thought of many of her favourite wild flowers with

* *Cytisus scoparius*.

the same kind of blossom, saying, "I shall always know a leguminous plant if it has that kind of flower."

COMMON FURZE.

"Several fruits, such as the tamarind, and various gums, drugs, dyes, and balsams, are ob-

tained from foreign plants of this tribe," said her father; "such as gums Arabic and Senegal, the drug senna, the valuable indigo, &c.; while in the South American forests there are pod-bearing trees of enormous size and extreme age. They are called locust-trees, and almost incredible stories are told concerning them. Fifteen Indians, it is said, with outstretched arms, can scarcely embrace one of the trunks; and when the concentric rings of one of these giants were counted, they led to the conclusion that the tree was more than two thousand years old; that is, that it dates earlier than the time of our Saviour."

"What wonderful trees!" said Henry. "We can scarcely fancy such giants to be related to our peas and beans."

"Leguminous plants are found in almost every part of the habitable globe; except in two small islands, which I will show you on the map."

Henry quickly brought a map of the globe; and his father pointed out St. Helena, and Tristan d'Acunha, both in the South Atlantic Ocean.

"Then poor Napoleon could not have had any fruit or vegetables of that kind!" said Henry. "I dare say peas and beans would not have grown

there, or anywhere else within the tropics; but tamarinds might, and other fruits and balsams."

"The fragrant resin called Lign-aloes is obtained from a plant of this tribe," said his father; "and so are the balsam of Tolu, used in lozenges, and the balsam of Peru, which gives a peculiar fragrance to pastiles. The Tonga bean, also, is a fragrant seed used by perfumers and makers of snuff. I have thus told you a few of the uses of leguminous plants; but, notwithstanding their value to us, many of them are injurious in their properties: the seeds of the laburnum are poisonous, so is indigo, and the bark of several foreign trees. In the plants we commonly use, or give to our cattle, the hurtful qualities are almost entirely absent; but there are some, even of these, which must not be used too freely, or they become unwholesome. The next tribe also has this contrariety, of yielding agreeable fruits whilst its general principle is poisonous; far more so, indeed, than that of leguminous plants."

"Is it a tribe that we know anything about?" asked Robert.

"Yes; and which you enjoy as much as any

one. It is the ALMOND tribe, and contains cherries, peaches, nectarines, plums, and almonds."

BLOSSOM OF THE SLOE OR BLACKTHORN. (*Prunus spinosa*.)

"But none of these delicious fruits are poisonous—are they, papa?"

"The leaves and kernels yield an abundance of

prussic acid, which is a deadly poison; and the fruit, too freely indulged in, brings on dangerous complaints; so that the plum season is frequently a time of sickness. Perhaps the most wholesome of these fruits is the peach, and it certainly is the most delicious. Our common laurel,* notwithstanding its name, which would naturally lead you to suppose it a member of the Laurel tribe, belongs to the Almond tribe, and partakes strongly of its poisonous qualities. This tribe, and several which follow, are nearly related to the ROSE tribe, as you might guess by the blossoms, which much resemble, on a smaller scale, those of the wild rose. The APPLE tribe has a similar likeness and relationship; and how beautiful are its clusters of rose-like blossoms at this season!"

"Yes," said Mary, looking towards the orchard; "the trees are quite white with blossom, and are prettier than anything we have in the garden yet."

"This useful tribe contains the apple, pear, quince, medlar, service, mountain-ash, hawthorn, &c., all the species being trees or bushes of the northern hemisphere only. Another small tribe (of which the common burnet,† and the lady's

* *Cerasus laurocerasus*.

† *Sanguisorba officinalis*.

mantle,* are members) comes between this and the true roses. There is a foreign plant† of this

FRUIT OF THE HAWTHORN. (*Crataegus oxyacantha*.)

BURNET tribe, the leaves of which are said to be an excellent substitute for tea. In Tasmania it is a troublesome weed, well known for the annoyance caused by its fruit hooking into the dress of pedestrians. To keep this little tribe in your memory I must show you a dried specimen of the field lady's mantle, a humble plant, but very common, with small greenish flowers almost concealed in the

* *Alchemilla vulgaris*.

† *Acaena sanguisorba*.

leaves. But we now come to the more attractive roses.”

FIELD LADY'S MANTLE.

Henry thought the ROSE tribe must be more beautiful than useful, for he had never heard of anything made from it except rose-water, and attar-of-roses, and conserve-of-roses: but he soon found that the tribe is not confined to the mere rose and sweet-briar, but includes the strawberry,

raspberry, and blackberry, with the pretty potentillas and geums of the garden and fields, the tall agrimony, and the elegant meadow-sweet,* or queen of the meadows, &c.

DOG-ROSE.

“I am glad,” said Mary, that the rose is our

* *Spiræa*.

own English flower, it is such a sweet and beautiful one."

"True; yet there are sad remembrances connected with it; for during the fatal struggles between the Houses of York and Lancaster, which filled our country with misery and bloodshed from 1450 to 1485, the white and red rose were taken as badges by the rival parties."

"Oh, yes!" said Henry; "York took the white rose, and Lancaster the red; and those terrible civil wars were called the 'Wars of the Roses.' At last the red rose married the white; for Henry VII. was of the House of Lancaster, and he married a daughter of the House of York, and so ended the quarrel."

Mary had her scrap of poetry ready, as usual; and, as they drew near home, she sang this little ditty to her brothers:—

"The Rose is red, the Rose is white,
The Rose it blooms in summer's light;
But ah! it clouds the heart's delight,
To muse upon its history:—
"It tells full many a woeful tale,
Of hearts made cold, of cheeks made pale,
Of love's sad sigh, the widow's wail,
In days of strife and chivalry.
Sweet Freedom, may the age prevail,
That strife no more may be!"

CONVERSATION X.

SAXIFRAGE — HYDRANGEA — LOOSE-STRIPE — ELM — BUCKTHORN —
SPINDLE — GENTIAN — EBONY — HOLLY — NIGHTSHADE — OLIVE —
CONVOLVULUS — DODDER — TOBACCO — THRIFT — PLANTAIN — PRIM-
ROSE — JASMIN — BORAGE — LABIATE — VERBENA — FIGWORT —
BUTTERWORT — CAMPANULA, AND SCABIOUS TRIBES.

HENRY had a tolerably large piece of garden-ground, which he cultivated according to his own fancy. The greater part was planted and sown with vegetables; but he had a little flower-bed separated from the rest by rock-work of his own contrivance. Upon this rock-work he was now busy planting some roots which required very little soil, and were therefore likely to thrive among the stones. One of these was the pretty little plant called London Pride; and when Henry showed it to his father, he was told that it belonged to the SAXIFRAGE tribe, which consists of humble plants, natives of cold mountain districts, and springing up freely amongst the turf in such situations. Most of them have white flowers, dotted with yellow or green or red. "The little

plant in your hand," said his father, "was once very common in the neighbourhood of London; hence its name: but I have heard it called 'Jerusalem stars,' and also 'None-so-pretty.' You will not expect to hear that the showy HYDRANGEAS of the greenhouse are near relations of these, and form the next tribe."

Mary had heard her mamma say that in Japan a species of hydrangea is dried, and used as tea, which is so much admired by the inhabitants, that they give it a name which means "tea of Heaven." Her father said

PURPLE LOOSE-STRIFE.

that the purple LOOSE-STRIPE,*—a handsome plant which adorns the banks of rivers with its tall spikes of blossom in July and August,—stands in a neighbouring tribe to the humble saxifrage: which also contains the Egyptian *henné* plant, used by women to stain their hands and feet of an orange colour.

Near Henry's garden stood a large elm; and his father now plucked from it a little blossoming spray, as a specimen of the ELM TRIBE, which contains trees and shrubs of the northern hemisphere. "Our common elm,"† he said, "is a handsome and lofty tree, whose masses of foliage give a rich effect to many an English landscape. The timber is less valuable than that of the oak or beech, being coarse-grained and comparatively soft; but it is highly useful for many common purposes, and resists moisture so well that it is especially fitted for water-pipes under ground, or for any similar purposes. These little flowers will soon be followed by clusters of seed contained in winged seed-vessels, not quite so large and conspicuous as those of the sycamore, but so numerous as to rustle on the branches like leaves, until the wind scatters them

* *Lythrum salicaria*.

† *Ulmus campestris*.

over the country, and sows a fresh crop of these useful trees. The elm tribe is followed by the

SEED-VESSELS OF THE ELM.

BUCKTHORNS and SPINDLE-trees, the latter curious for the pink-lobed seed-vessels with which one of its species,* the only British one, adorns our hedges in autumn. But I now lead you to several tribes owning connection with those pretty little deep-blue flowers, the GENTIANs."

* *Euonymus Europæus*.

"Then I suppose they are all bitter plants," said Robert; "for mamma says the gentians are very bitter, and that one of them* is very much used by druggists on that account."

LEAST GENTIAN.
(*Exacum filiforme*.)

"Most of their relatives are also powerfully astringent and bitter; but one tribe is chiefly noted for producing hard black timber called EBONY, others for having intensely poisonous seeds, as those produced by a tribe of trees and shrubs, chiefly tropical, called DOGBANES on account of their poisonous qualities. To this latter tribe belongs our pretty little PERIWINKLE,† which cheers us when there are few other blossoms. Neighbour to these also stands the HOLLY tree,‡ which forms the only

species of its tribe native in Britain.

"Among the dangerous plants of this Gentian alliance, the most fatal perhaps is the notorious Indian tree, Strychnos Nux Vomica, which bears a

* *Gentiana lutea*.

† *Vinca*.

‡ *Ilex aquifolium*.

handsome orange-coloured fruit, the size of a small apple, the pulp of which is eaten by birds without any ill effect. This fruit, however, encloses seeds which are extremely poisonous, and which furnishes the drug *nux vomica* of our shops."

"But I have heard of people taking it as a medicine," said Mary.

"In small doses, and under medical advice, it may be safely taken; but in large doses, it produces frightful convulsions, and death. You will perhaps be surprised to hear that near these venomous plants, come the BROOM-RAPES, those extraordinary brown parasites* that grow on the roots of hemp, clover, and other plants; but they also possess a bitter principle similar to that already described."

"I remember," said Henry, "what hard work I had to dig up a plant of broom-rape which was very deep in the ground, and had taken fast hold of the roots of the clover; it looked a poor decaying thing, but I found it very tough and leathery."

"The poisonous nature of some of these tribes will prepare you for another group, possessing also

* *Orobanche*.

COMMON NIGHTSHADE.

LESSER DODDER.

dangerous qualities; and you will here again observe that some of our cultivated vegetables are obtained from very suspicious orders. The group I speak of contains the NIGHTSHADE tribe, and the OLIVE, CONVULVULUS, and DODDER tribes,—the last being, as you know, curious parasites on various plants, such as that which infests the furze and heath on our downs.”

“Nightshades are dreadfully poisonous,” said Mary; “and there is a very sad tale in my Poetical Companion, of a poor little brother and sister who died from eating the berries of the deadly nightshade.”

“The Nightshade tribe contains also the henbane, which is a very poisonous weed at the time the seeds are forming, though comparatively harmless at other times; also the pretty petunias, the tobacco plant, and the common potato.”

There was a general exclamation of surprise among the children, when they heard that the potato belonged to this poisonous tribe.

“And yet,” said Robert, “I remember mamma told me not to chew the berries when I was gathering the pretty blossom of the potato.”

“The leaves and berries of the potato are nar-

cotic, while the underground part of the plant is perfectly wholesome. Even the fruit and seeds in some plants of this tribe are eatable; for instance, the tomato, or love-apple, and the different kinds of capsicum, the ground seeds of which are the chief ingredient in cayenne pepper."

"Tobacco cannot be unwholesome," said Henry, "for some of the healthiest old people in the village are smokers."

"Moderately used, it does not appear to be injurious: but when taken in excess, it is liable to bring on paralysis. Oil of tobacco is a very powerful poison; and even the minute quantity inhaled in smoking causes nausea in persons unaccustomed to the use of it. The tobacco plant is, as you know, a very handsome one; and when cultivated over a large extent of ground, it has a most striking appearance.

"But we must not pass over the OLIVE TRIBE with the mere mention of its name, for it contains several of our especial garden favourites, in addition to the important species* which gives the name to the tribe, and which supplies the well-known olive oil."

* *Olea Europæa.*

FLOWER AND BERRY OF COMMON PRIVET.

“I am wondering what relations of the Olive we can have in our garden,” said Henry.

“The shrubs which will soon be its chief glory ; (for there is great promise of blossom on the lilacs* this year) and the handsome ash† trees, whose light and graceful foliage is so late in coming out, and so pretty when it *does* appear ; and the useful little dark-green privet‡, which thickens our shrubberies, and is not unornamental when covered with its clusters of small white flowers.

“Of the CONVULVULUS tribe I must just say that the roots abound in acrid milky juice and in some foreign species furnish jalap, and scammony.”

Mary did not like to hear of her beautiful bind-weeds, and handsome garden convolvulus being related to jalap ; but her father informed her that the Syrian plant which yields that drug is a beautiful climber with long crimson flowers.

“The next group of orders also contains some old favourites, such as the different kinds of THRIFT, the PLANTAINS, more important to birds than to us, and the PRIMROSES. The last-named tribe will be

* *Syringa vulgaris*.

† *Fraxinus excelsior*.

‡ *Ligustrum vulgare*.

the most interesting to you, for it includes the

SEA-LAVENDER* AND THRIFT.†

cowslip, oxlip, auricula, cyclamen, pimpernel, and others."

* *Statice spathulata*.

† *S. armeria*.

"Then the little scarlet pimpernel is related to the primrose," said Mary. "I am glad I know its family connections, for I could not tell anything about it, except that it is the 'poor man's weather glass,' giving him warning by shutting up its blossoms before rain."

CHAFF-WEED.
(*Centunculus minimus*.)

"The delicate bog pimpernel, which mamma is trying to raise in the greenhouse, must belong to the same tribe," said Henry.

"Yes; and the yellow pimpernel, or wood loose-strife, and the beautiful water violet, or feather-foil, and the tiny chaff-weed, all these, and many foreign families, make up this pretty tribe, consisting entirely of monopetalous flowers."

Robert wished to know what that meant; and his father sent him to gather a primrose, and showed him that, instead of having several separate flower-leaves, or petals, all have grown together into one petal, which can be pulled off in one, with the five anthers growing to the inside of its tube. Hence the flower is called *monopetalous*, or with one petal: if it had several, it would be called *poly-*

petalous, or with many petals. The Jasmine and the Borage tribes are monopetalous, the beautiful

BORAGE.

starry flowers of the former being too apt to prove their monopetalous character by dropping off

entire as we gather them, while those of the latter are mostly bell-shaped or funnel-shaped, as in the common comfrey, whose clusters of white or purple bells, and large rough leaves, are so frequent in ditches.

“I know it well,” said Henry, “for Mary has sent me into many a ditch to gather it. Viper’s bugloss has leaves still rougher and more prickly, and pretty bell-shaped flowers, and I remember mamma said it was related to comfrey. Both these plants have just the same trick as the jessamine of dropping their blossoms unexpectedly.”

“True; and so have gromwell, alkanet, hound’s-tongue, borage, and the various kinds of scorpion-grass, one of which is the true ‘forget-me-not.’”

Mary inquired why that beautiful and innocent flower is called scorpion-grass; and she found that the shape of the flowering stem, which curls round at the top like a scorpion’s tail, has given it the name, in the same way that the soft and downy leaves of most of the plants of the same family have given the title of *Myosotis*, or mouse-ear.

But her father now began to speak of a tribe which is very easy to be known, because all its flowers are LABIATE or lipped (that is, the two

parts of the corolla are like lips, either closed or gaping), and grow in whorls or rings round the stem at regular distances.

“That is how nearly all the plants look in the herb-garden,” said Robert; “so I suppose mint, and thyme, and marjoram, and sage belong to it.”

“If sage does, then the salvias must also,” said Mary; “for mamma says that *salvia* means sage, and that the beautiful red and purple salvias are near relations of common sage.”

Henry recollected many other examples of these lipped flowers,—such as lavender, penny-royal, horehound, rosemary, and ground-ivy.

After remarking that the chief value of the tribe arises from its aromatic qualities, making it useful for culinary purposes, his father went on to speak of the VERBENA tribe, which is of little importance except as furnishing the valuable timber called teak, which is the produce of an enormous tree* growing in the mountain-forests of Malabar and other parts of the East Indies.

The children were surprised to hear of such a tree among the verbenas, having only seen small herbs of that name.

* *Tectona grandis*.

“When you were speaking of lipped flowers, papa,” said Robert, “how was it you did not mention the snapdragon?”

WHITE HOREHOUND. (*Marrubium vulgare*.)

“Because that belongs to a different tribe,

whose properties are dangerous instead of wholesome; and even the blossom, which may seem to you at first sight to be shaped like that of salvia, is really very different, having in some cases a long spur at the back, and not growing in whorls, besides other less conspicuous botanical differences. The snapdragon belongs to the FIGWORT tribe, which contains also the curious calceolaria or slipper-flower, the mimulus, fox-glove, mullein, and others, not forgetting the figwort itself, a plant of ill odour, which you have found in the woods, with dull greenish flowers in a cluster, purplish at the lip. Near to these plants there is a small tribe called BUTTERWORTS, which perhaps I should have passed over, except for a curious use to which the common butterwort is put in Lapland, and which has been described by Linnæus."

The children wished to know what that use was, and they were told that the fresh leaves of the plant are laid on a sieve, and a quantity of milk, warm from the cow, is poured over them, and allowed to stand a day or two, when it becomes solid and compact, and most delicious to the taste. The plant, it is stated, prevents the formation of cream or whey, but renders the whole of the milk

FOX-GLOVE.

PALE BUTTERWORT.
(*Pinguicula lusitanica*.)

rich and consistent. A small portion of this solid milk acts in the same manner upon that which is fresh.

“I hope butterwort grows in England, that we may get some of this solid milk,” said Mary.

“The plant grows in the northern counties, and also in Scotland,” said her father; “but I have never heard of any attempt to put it to the use described by Linnæus. But we now arrive at the bell-flowers, a tribe that I know will please you, containing, as it does, the little harebell of the downs, and the various CAMPANULAS of the gardens, blue and white.”

“I like them very much,” said Mary; “but I cannot take so much pleasure in them since I have heard that they are poisonous.”

“You need not be disturbed on that account,” said her father; “for although their juices are certainly acrid, yet the root and the young shoots of many species are occasionally used as food, especially those of the rampion bell-flower.* But I must not pause at these plants, nor at the lobelias, which are more acrid still, nor at the valerians, —the roots of which have such an odd effect in

* *Campanula Rapunculus.*

bringing on a kind of intoxication in cats; a few words on the SCABIOUS tribe must close our present conversation."

The large purple flower-heads of the field scabious had sometimes tempted the children a few steps among the standing corn; and they also knew the devil's-bit scabious, which they had dug up in the meadows on purpose to see the root,

FULLERS' TEASEL. (*Dipsacus fullonum*.)

which is black, and ends abruptly, so that old stories say the devil, envious of its good qualities,

has bitten it off, that it may not flourish. They were therefore pleased to hear that the scabious tribe is a very important one, on account of the teasel family, which belongs to it.

"The teasel is that handsome plant with a large prickly head of lilac flowers," said Henry. "Its large leaves have very sharp thorns at the back, and they meet together round the stem, so as to hold a great deal of water."

"Another kind of teasel," said his father, "largely cultivated in the clothing districts, supplies the prickly heads so much used in the cloth manufacture. When you accompany me to some cloth mills, you will be amused to see the numbers of teasel-heads fixed in frames, for the purpose of raising the nap on cloth. Delicate kinds of machinery have been tried for this purpose, but nothing is found to succeed but the teasel, so that it is of high importance to our manufacturers."

CONVERSATION XI.

COMPOSITE—EVENING PRIMROSE—MYRTLE—CACTUS—CURRANT—
SYRINGA—CRANBERRY—COFFEE—HONEYSUCKLE, AND GALIUM
TRIBES.

“I WISH we could get rid of these troublesome daisies on the lawn,” said Robert; “they are quite thick again, and yet the gardener thought he had rooted them all out.”

Mary could hardly bear to have a daisy found fault with, wherever it might show its face, for it was the first flower she could remember gathering; and she still loved to watch its crimson-tipped blossom closing up at sunset and opening wide in the morning, earning its title to be called the *day's eye*. Her father told her to examine a daisy,* as an example of a very extensive tribe, called COMPOSITE FLOWERS, all of them approaching more or less to a starry shape, and many of them called *asters* on that account.

The children had been picking daisies to pieces while their father spoke; and Henry said he

* *Bellis perennis*.

thought he had found out why such flowers are called composite, for instead of being one blossom, the daisy is made up of a great many little blossoms, all huddled together.

DAISY.

“I never noticed before,” he said, “that the middle of the daisy is nothing but a mass of these tiny flowers, and each seems to have its own sta-

mens and pistil. But I suppose these rays spreading round the edge are only petals."

"Look at them well, and you will see that they also are florets, each having its own pistil, but no stamens, while the centre florets have each five stamens, as well as a pistil. These outer florets, you see, are strap-shaped, the inner, tubular; and a number of composite flowers are made closely on this pattern, as the yellow corn-marigold, the white ox-eye, the com-

BURDOCK. (*Arctium lappa*.)

mon yarrow, camomile, golden-rod, colt's-foot, and others. But if you gather one of the dandelions* in the orchard, you will find that it does not agree with this pattern, although it is a composite flower."

Mary ran and gathered it, and she soon saw that all its florets are strap-shaped; and her father told her, that when she could meet with a thistle in blossom, or its near relation, the burdock, she would find just the reverse to be the case, for all

* *Leontodon taraxacum*.

the florets in those plants are tubular, and there is no ray at all.

Robert remembered a number of garden flowers which must belong to this composite tribe, such as chrysanthemums, china-asters, dahlias, marigolds, Michaelmas daisies, hawkweeds, &c.; and Mary found out that a piece of groundsel, which she had gathered for her bird, also belonged to it.

“Now I understand,” she said, “how it is that dandelion and groundsel have such a quantity of seeds. Every little floret, I dare say, has its own seed; and when they are all ripe, and have got their silky wings ready, then they spread out into those pretty globes, and are ready to fly away with the least puff of wind. Yes, and that must be the plan with the globe-thistle, and all the rest of the thistles. No wonder they are called composite, if that means many together.”

“Yes,” replied her father, “and not only many together, but that cannot do without each other. These florets, some without stamens and some with stamens, are necessary to each other in a different way from ordinary clusters of flowers, each of which may be perfect in itself.”

“How is it,” said Henry, “that some of our

WORMWOOD.

garden flowers have no seeds at all, although they are of this kind?"

"Because by the gardener's art the flower has been rendered double; that is, those parts which were once stamens have been transformed into petals, and petals without stamens cannot produce seed. Several of the composites are very handsome and ornamental; but there are others which are simply useful, as artichokes, succory, endive, lettuce, camomile, and wormwood.* Your favourite and sweet-scented southernwood is also one of this tribe.

"Passing by some foreign and little known plants, I must here mention the EVENING PRIMROSE and the MYRTLE tribes. The evening primrose,† whose tall spikes of pale-yellow blossoms enliven the shady parts of our gardens, gives its name to a tribe which includes the pretty *Oenothera*, with its wild relations the Willow-herbs, and also the *Clarkia*, the *Fuschia*, and others. To the same tribe belong two species of plants called Enchanter's Nightshade,‡ one of which is often a troublesome weed in gardens."

* *Artemisia absinthium*.

† *Oenothera biennis*.

‡ *Circæa*.

EVENING PRIMROSE.

"Then I suppose this is a tribe of poisonous plants," said Robert.

"Not so: the roots of several are eaten, and the fruit of some of the fuschias is tolerably palatable; a few have acrid and emetic properties, but the Nightshades are comparatively harmless; their ill-repute chiefly arising from their bearing the same name with the Deadly Nightshade, which belongs to the same tribe as the potato. The Myrtle tribe consists of plants having a fragrant and aromatic quality, very powerful in cloves, which are the dried flower-buds of a plant of the myrtle kind, and almost equally so in allspice, the dried fruit of another. To this tribe we also owe the delicious preserve called guava jelly, made from the pulpy fruit of the guava; also various valuable gums and aromatic oils. The gum-trees of Australia are of this tribe, and they are not a little remarkable."

"How so, papa?" said Henry.

"From their peculiar growth; for it appears that they rise to the height of 100 or 150 feet before they send out any branches, and are then crowded with beautiful willow-like foliage. Growing near each other, they look like an assemblage of

elegant columns; and some of them, called stringybark gum-trees, are said to rise nearly as high as the Monument in London without branching."

"How I should like to see them!" said Henry; "but there would be no hope of climbing such trees as those."

"I do not expect," said his father, "that any of you will feel much interest in the tribes immediately following these, for they contain plants which you call ugly, notwithstanding their handsome flowers."

"Papa must mean the CACTUSES," said Mary, "for we never liked them very much, they are such odd, clumsy-looking plants. Where do they come from?"

"From America, where some are valued for a refreshing and agreeable fruit, which has a similar taste to our currants, and very much the same properties. And although you have never seen any other description of cactus than strange succulent plants without leaves, yet there are some kinds which bear leaves, and which when old become woody in their stems. Humboldt even speaks of a forest of such plants, grown to the stature of trees, and yielding wood fit for domestic uses."

“I shall not dislike them so much now I know they are useful, and bear nice fruit,” said Mary.

“I have just said that in their properties some of these plants closely resemble currants; therefore you will expect to hear that the CURRANT tribe is not far off, however different its outward appearance may be.”

“Currants and gooseberries are of the same family,” said Henry. “Mamma says that they never thrive except in cool countries like our own, but that the English often try to make them grow in hot countries, for the pleasure of eating the fruits they had at home. Mamma saw a number of little gooseberry and currant trees planted close together, that they might be put under air-tight glass cases, to be sent to the West Indies, but she did not expect they would live very long there. The pretty flowering currants, that bear such a quantity of pink blossoms, in the shrubbery, are related to our favourite fruits.”

“Plants of this tribe are very abundant in North America,” said his father; “and they even occur among the mountains of northern India, where the climate is comparatively cool. Neighbouring tribes are the SYRINGAS, and some curious tropical plants

with fleshy fruit, which children are very fond of, but which has the strange property of making their complexions quite yellow."

"How very odd!" exclaimed Mary. "The children of that country must look as if they had the jaundice. What is the name of the tree that bears such strange fruit?"

"Botanists call it *Gustava speciosa*; and they tell us that the effect on the constitution ceases in one, or at most two days, after which the children regain their natural colour. The next tribe I shall mention is the CRANBERRY tribe, containing cranberries, bilberries, and whortle-berries, (which are all of one family,) besides many foreign sorts. You are well acquainted with these fruits as preserves, although you have only seen whortle-berries growing. Not far from these comes the COFFEE tribe, one of the largest we have, containing some of the most important remedies known in medicine, as cinchona, ipecacuanha, and others. But these will scarcely interest you so much as coffee itself, which is, as you know, a most important plant, furnishing a wholesome beverage almost as universal as tea."

Mary wished to know what sort of tree it was;

and she was told that it is from eight to twelve feet high, with slender drooping branches, bearing evergreen leaves, like the bay, white starry blossoms like the jessamine, and red fruit, like the cherry.

“But the fruit,” continued her father, “is insipid, and would be little prized were it not that each contains two hard oval seeds, enclosed in a parchment-like membrane. These seeds are the coffee-berries. But let us leave this tribe for one that gives us the sweetest ornament of our rustic porch.”

“Oh, the honeysuckle!” said Mary. “It is already showing some early buds; and next month, I dare say it will be covered with blossoms, as it was last year.”

“The HONEYSUCKLE tribe is not only interesting for its fragrance and beauty in these climbing species, but for the elegance or the usefulness of some that do not climb, such as the delicate little northern plant called *Linnæa*, in honour of the great botanist, and the hardy and useful elder, from which a great quantity of wine is made in England, much of it employed, I fear, in the adulteration of port wine. Some of the *Viburnums*

or Gueldres roses, bear a fruit, the pulp of which is made into cakes by the North American Indians.

LINNÆA BOREALIS.

The children did not expect to hear that the

gueldres rose was so near a relation to the honeysuckle, for they thought its large white balls were more like the blossom of the hydrangea than of any other flower. And they were told that, in fact, they do come so near hydrangeas, as to be separated by what seem very small points of difference. "I do not expect you," said their father, "to understand the reasons why certain flowers are placed in one tribe and not in another. There are many tribes, indeed, where the family-likeness is so strong, and where the known qualities of the plants are so much alike, that you may feel tolerably certain as to their situation; but for the greater number, you must simply depend on what you are told about them. I have named the different tribes, as nearly as possible, in the order pursued by an eminent modern botanist;* but every tribe in its several families touches so many other tribes, that we dare not say that in nature they follow the exact order in which we place them, just one after the other."

"No," said Henry; "perhaps they go side by side, three or four tribes together, instead of in a single line."

"Or perhaps they go round in a ring," said

* LINDLEY.

Mary, "and then all the rings get joined together like the links of a chain."

"Very good ideas," said her father; "and you may fancy, if you please, when I have spoken of a group of tribes connected with each other, that they are friendly companies walking abreast, or holding hands all round."

Mary was delighted with this notion, and began to fancy the whole vegetable creation a succession of flowery wreaths, linked together into an endless chain, until she recollected that there are flowerless plants as well as flowering ones.

"I see a flower in yonder hedge," said her father, "which will illustrate our next tribe. It is a slender, weak-looking plant, but covered with tiny yellow blossoms."

Robert ran to get it, and he knew at a distance that it must be the plant his mamma called GALIUM, or crosswort bed straw. "I know what it is," said he, as he came running back, "and I know what its relations are, for mamma told me to look at its leaves, which grow round the stem like a star; and then she showed me some sweet woodruff, and some cleavers, or goose-grass,* which grow just the same."

* *Galium aparine*.

"Then you already know a very striking mark of the whole tribe, in which these whorls of leaves growing on square stems are, I believe, universal. The most important plants in it are the different kinds of madder, which afford a valuable dye; nevertheless, I dare say Mary places "sweet wood-ruff" foremost, because it makes her wardrobe smell like new-mown hay. Do you remember, Henry, the old-fashioned way of spelling wood-ruff?"

"Yes, papa, it is this: Double *u* double *o* double *d e*, *R o* double *u* double *f e*, making *woodde - rowffe* ; but

mamma says it was sometimes called *wood-rowel*, because the leaves stand out round the stem like the rowels of a spur."

GOOSE-GRASS.

CONVERSATION XII.

UMBELLIFEROUS—IVY—CORNEL—WITCH-HAZEL—SANDALWORT—
LORANTH, AND BIRTHWORT TRIBES.

As the earlier spring flowers disappeared, the fields, hedges, and ditches began to display great numbers of what the children were taught to call umbelliferous flowers. These had their small blossoms arranged at the end of little rays, all spreading out from the stem like the spokes of an umbrella, forming what is called an *umbel*; and they generally bore at the end of each principal ray a number of smaller rays, making altogether what is called a *compound umbel*.

As most of these plants come into blossom at the same time, the children were desired to collect as many different kinds as possible; and when their father examined them, he found wild carrot and celery, and several species of parsnep and parsley, besides archangel and hemlock. "Some of these plants," he said, "in their cultivated state are very useful to us as vegetables, but they are not

safe otherwise. Celery, for instance, in its wild state is poisonous, and even under cultivation only that part is wholesome which has been blanched by covering it from the light. I am not aware that anything can be said against wild carrot and parsnep; but fatal accidents have arisen from persons eating what they thought was the root of one of these, but which really proved to be that of the hemlock water drop-wort,* a highly-dangerous plant, having a yellowish juice in its root and stems. Fools' parsley† and common hemlock‡ are also most dangerous plants; a poor boy who ate a small portion of the root of water hemlock§ died in an hour and a half; and I am told that it is sometimes fatal to cows, who eat of it when they go down to rivulets to drink. Happily, it is not a very common plant, or we should more frequently hear of accidents from it."

The children did not get a very favourable idea of umbelliferous plants from what their father said; but they remembered that there were some pleasant exceptions in caraway, coriander, and a few other plants which they had raised in their

* *Enanthe crocata.*

† *Aethusa cynapium.*

‡ *Conium maculatum.*

§ *Cicuta virosa.*

own gardens, by planting some of the seeds out of their mamma's spice-box.

COMMON HEMLOCK.

“ I can show you a plant which has its blossoms in a simple umbel, and yet belongs to another

tribe," said their father, pointing to the ivy on the garden wall. "The ivy tribe is generally more

IVY.

woody of growth, and more harmless in qualities than its neighbour; many of the families are tropical, and one of them produces the ginseng root, so much prized by the Chinese for its warm and pleasant flavour, but which you must not confound with ginger. In the ivy tribe is Mary's

TUBEROUS MOSCHATEL.

‘dear little plant,’ as she calls the little moschatel,* with its humble growth, and curious little

DOGWOOD.

cluster of yellowish-green flowers. Following the ivy, come the CORNELS and the WITCH-HAZELS. The

* *Adoxa Moschellatina*.

wild cornel* is the dog-wood, whose deep-red branches, clusters of white flowers, and large leaves turning red in autumn, make it so conspicuous a shrub in hedges. The bark of several American species of this plant has a great reputation as a tonic, and is said to answer the purpose of Peruvian bark in intermittent fevers. But these tribes of small trees, or shrubs, must not detain

COMMON MISLETOE.

us, for I have now to dwell for a few moments on three tribes which resemble each other in having no petals, as well as in other more important botanical particulars: they are the SANDALWORTS—one producing the sandalwood of commerce; the LORANTHS, a tribe of parasites, one of which is our common mistletoe; and the BIRTHWORTS, curious plants, of which you may find one specimen in the

* *Cornus sanguinea*.

common birthwort of our woods and thickets. With these humble, and comparatively unimportant tribes, I conclude my task, and release you from a subject in which I must confess you have been more interested than I could have hoped or expected."

"Dear papa," said Mary, "I am sure we are all sorry, and not glad, to be released from the subject; and I am very much disappointed that you are come to the end so soon, for I thought we should go on hearing of plants that were more and more beautiful and curious, until we came to something quite grand and wonderful at last."

"Instead of which," said her father, "it is here that the two extremities of the chain meet; so that at the very place where you expected the highest and most perfect forms, there is, on the contrary, a return towards the earliest and simplest. For instance, the last tribe I have mentioned is one which declines so much from the structure of an exogen towards that of an endogen, that it seems just fitted to occupy that point where we may suppose the chain to return into itself, making up the endless series of vegetable forms. And whatever arrangement we follow, the same thing must to a great extent take place."

"If we are come to the place we set out from," said Mary, "I really should like to begin again, and go over all the tribes a second time."

"Try to do so amongst yourselves," said her father, "and when you are at a loss, apply to me. I am most anxious you should all acquire the love of plants, and the power to recognise them and to tell their history, for I know it will be for your good."

"It is very pleasant," said Robert; "but what particular good will it do us?"

"It will add new pleasures to your youth; it will be a great relief and recreation amidst the cares of middle age; and it will be a light and pleasant employment for old age, if it should please God to prolong your life."

"And then it will always make our walks amusing," said Mary; "for we shall never go out without finding something to notice, or to carry home for drying; and when we go to a new place, how pleasant it will be to find plants that we had never seen before! Do you remember, Henry, how delighted we were when we first saw the horned poppy on the shore, near Brighton?"

"Yes," said her brother; "but I should have

been much better pleased if the leaves had not turned black in drying. But, papa," he continued, "I do not understand how old people can take much pleasure in botany. They generally stay at home a great deal, and do not often travel, so that they cannot have much chance of finding new plants."

"I assure you," replied his father, "that old people, and even sick people, if they have cultivated this taste in their youth, find it a great resource in the season of their infirmity. An invalid lady once made a very beautiful collection of plants while confined for a long period to her couch; and this she managed by sending a servant to collect considerable quantities every day, from which she selected those that were worth drying. A valued friend of our own was cheered to her dying hour by a remarkable love of flowers, in which I believe she saw emblems of that pure and sinless state on which, through the merits of her Redeemer, she has now entered. And with respect to the aged, nothing I can say will give you so good an idea of the value of this sort of knowledge to them, as a beautiful passage which I have read in Mr. Swainson's 'Discourse on the Study of Natural History.' Speaking of the old age of a true naturalist—that

is, one who looks from the created to the Creator, he says, 'Although no longer fit for active exertion, we can still fancy him contemplating his collections, the acquisitions of his youth and the study of his manhood, with that complacency which we feel towards an old companion. Every object in his little museum has its own story ; the scenes and incidents of youth are brought back to his recollection in all their freshness ; and the memory, dwelling on these green spots in the desert of life, will oftentimes be prevented from recalling others of a less cheering nature. He looks abroad in the spring of the year, and sees the face of nature renewed with the same beauty and freshness as when he contemplated her in the spring of youth. *That* season of his life has long passed away, but he knows that he too will be renewed,—that *his* winter will be changed to an eternal spring ; and with firm but humble confidence in the promises of his God, he resigns the contemplation of his sublunary works, in the sure and certain hope of seeing those which are heavenly.' ”

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