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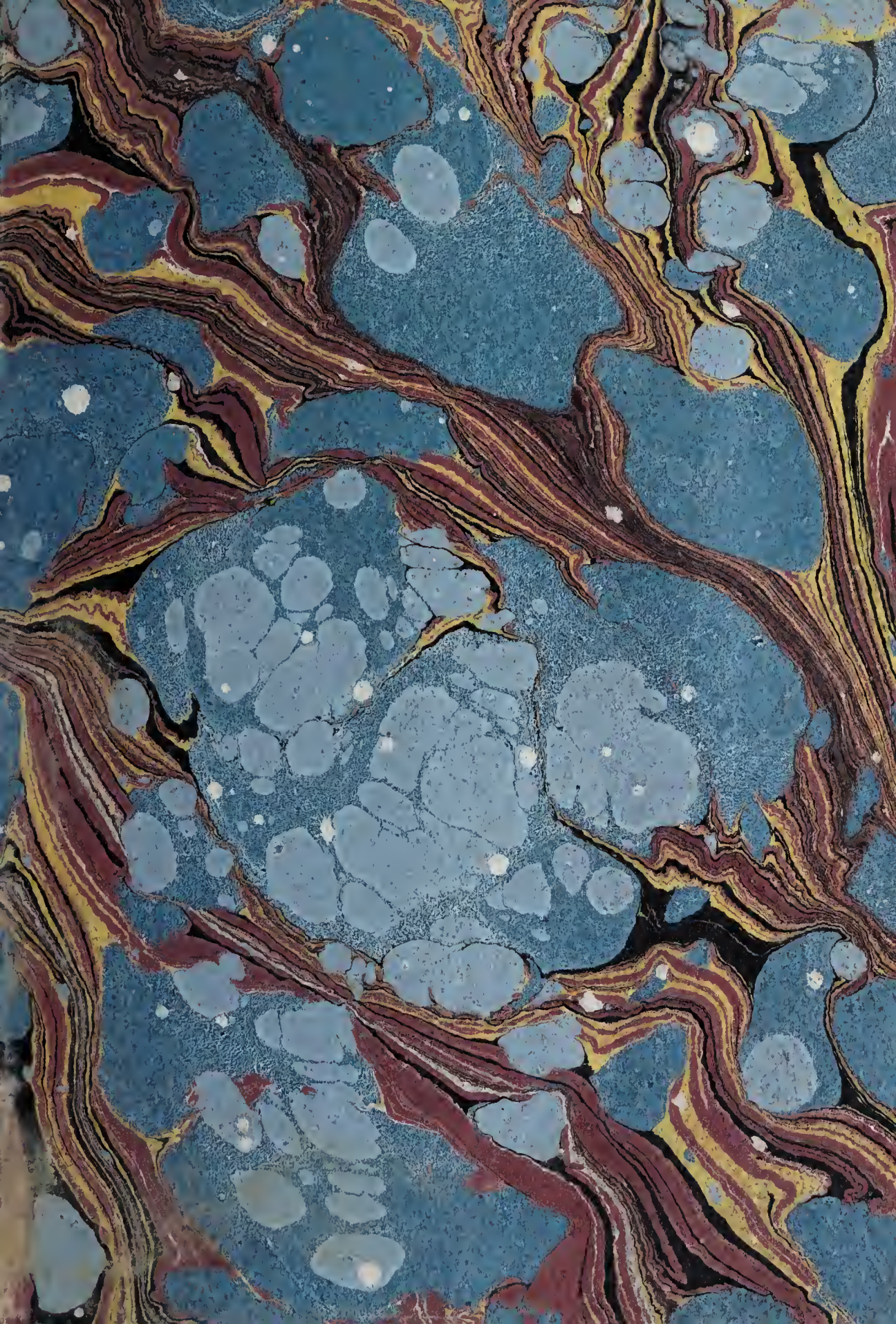

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PLAYING AT BOTANY.

BY

PHŒBE ALLEN,

AUTHOR OF "GILMORY," "SPRING AND AUTUMN," "A DOUBLE CHERRY," ETC., ETC.

WITH ILLUSTRATION BY MAUD NAFTEL.

"All are under One . . . .
. . . . . Not a flower
But shows some touch, in freckle, streak or stain,
Of His unrivalled pencil."

—COWPER.

LONDON:
HATCHARDS, PICCADILLY.

TO

MY GODCHILD DAISY.

M. A. A.

PREFACE.

As its title implies, this small work is simply meant for nursery readers, and pretends to teach nothing deep or difficult. My one object throughout has been to familiarize children with the sound of a few of the hard words which, at first starting, make Botany appear so unapproachable to small people. And with this object in view, I have not hesitated to repeat the same word and its meaning over and over again.

By letting each flower tell its own story, I have hoped to make its teaching especially attractive to those little readers who are still at the age when

> "A child feels equal still toward insect, beast and bird,
> Before the Adam in him has foregone
> All privilege of Eden; making friends
> And *talk* with such—

and thus awaken sufficient interest in them to inspire them with a longing to learn more about their little lecturers.

PHŒBE ALLEN.

ILEDEN,
BONCHURCH.
Jan. 1887.

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PLAYING AT BOTANY.

INTRODUCTION.

HOW IT ALL CAME ABOUT.

"And Nature, the old nurse, took
The child upon her knee,
Saying, 'Here is a story-book,
The flowers have written for thee.'"—*Longfellow.*

"I DO wish I knew more about flowers," said little Rhoda, as she sat on a sunny bank, one bright morning, early in May, "then my cousins wouldn't laugh at me when I ask if a buttercup and a dandelion aren't almost the same flowers; as if I *could* tell the difference. It's all very well for Mary and Janet who've seen wild flowers all their lives, but no buttercups or dandelions either grew near our house in that dingy old town where I have always lived till now." And Rhoda sighed.

She had asked Miss Primer, her cousins' governess, why they had laughed at her so for her mistake, and when Miss Primer said "Because, my dear, if you possessed the most elementary knowledge of Botany, you would know that a buttercup and a dandelion do not belong to the same family, or even to the same tribe:" the answer, though it certainly had some nice grand words in it, had left Rhoda very little wiser than she was before. "Do flowers grow in families, then?" she said to herself. "Dear me, how funny. I wonder—" and she looked at a little plot of daisies at her feet, "I wonder if that is a family party? Those two big wide-opened daisies must be the father and mother, I suppose, and those smaller ones are the children, and that little tiny shut-up thing with its pink top shewing above the green case *must* be the baby I should think, who has been sent to sleep. I wonder if they talk amongst themselves, and if they do, what they say to each other? I should like to know if they ever quarrel as Hugh and I do, sometimes. And I wonder if they know their own relations from other flowers. Now if Botany would teach me all that, I should like to learn it, only father's Botany book at home looks so dry. I'm sure I could

never understand it. It would be much nicer if the flowers would talk themselves and just tell me their names, and where they come from, and how many brothers and sisters they have; just as I have to answer grown up ladies when we come down to dessert, and they ask us a lot of questions of that sort. Yes, I *do* wish the flowers could talk."

"Well, well, so we do to people who understand our language," said a voice close to Rhoda's elbow. It was a little, thin, piping voice, like nobody's voice Rhoda had ever heard before, and she looked up and down and round the meadow to find out who the speaker could be.

"Here I am, here I am, close at your elbow," piped the little voice again; "you're just like the rest of the world, looking up at the moon to find what's just under your nose."

"I'm very sorry, I can't see you," said Rhoda; but as she spoke, her eye fell upon a beautiful golden buttercup, who was moving her shining head about so energetically, that she guessed now who the speaker must be.

"You wanted some of us flowers to talk, and tell you about ourselves," said the buttercup; "so here I am, and when I've done talking about myself

and my family, I daresay some of the other flowers will tell their own story in turn."

"Oh! but that would be beautiful!" cried Rhoda; "and will you begin to-day, now directly?"

"To-morrow I'll begin," answered the little buttercup, and before Rhoda could utter the cry of half-disappointment she felt at the delay, she was aware of a hand laid gently upon her shoulder, and looking up, she saw a kind old lady with a beautiful face looking down into hers.

"So you are really anxious to learn something about my pet children, my wild flowers," said the old lady, and her voice was the sweetest that Rhoda had ever heard.

"Oh, yes," answered Rhoda; "I should like to learn all about them, that is, if I needn't learn it out of a dull lesson-book with hard names."

Dame Nature—for that was the kind old lady's name—smiled. "Ah! it's all very well to abuse what is written in books, but if you really want to study me and mine, my dear, you'll do well to ask the help of my good friend here," and as she spoke, Dame Nature beckoned to another lady, younger than herself, but also very beautiful, who came forward and stood beside her. The new-

comer's eyes were far brighter than those of her elder friend; they shone like glistening lamps, whereas Dame Nature's eyes had a soft, tender light in them, like the gentle light of the stars, and her voice when she spoke, had a clear ringing sound in it, which was almost cold and sharp when contrasted with Dame Nature's sweet, soothing tones. And yet she smiled down very kindly upon Rhoda as she said, "So you are going to learn Botany, my child, from the flowers themselves, and so you think to escape all the hard names. Well, well, that's very pretty, but I think you'll find all the same, that you'll have to learn a few, because there's something hard in everything that's worth anything in the world. Now your own small body wouldn't be much good to yourself or anybody else if you hadn't a few hard bones in it to keep it together. And that tree," and the speaker pointed to the tall oak, at whose feet Rhoda was sitting, "although when it is covered with leaves and acorns, you quite forget the hard wood of its trunk and branches, yet, if these were taken away, what would become of the beautiful green foliage and the shining acorns? And just so a few hard names are the bones, as it were, which go to

the making up of my own body (myself, in fact, who am called *Science*), with all my limbs, of which Botany or flower-knowledge is one. And I am afraid you will find that your learning will soon tumble to bits if you don't have a few of my bones, my hard words, in your share of knowledge. See, here is a little book which tells you something about the commonest wild flowers, with as few hard words in it as possible. Take it, and make a rule of reading over the little that it says about each flower, as soon as that particular flower has told you its own story. I don't think then that you'll think it hard and dry," and the Lady Science took out from the folds of her robe a neat little roll, and placed it in Rhoda's hand.

"And I," said Dame Nature, "will instruct the best-known member in each of my twelve chief tribes to give you a lesson in turn, beginning to-morrow with the buttercup."

"And please may I bring Hugh with me? He doesn't like sitting still much, or reading lesson-books, but I think he'd like to listen to the flowers," said Rhoda.

"Certainly, my dear," said both her new friends, each holding out a hand to the child as they spoke.

"We love to help every one who wants to learn of us and most of all we love to serve as the key to each other; to act each one as the interpreter of the other."

Perhaps little Rhoda could not quite follow the meaning of these last words, but the tiny golden buttercup, who was to become her governess on the morrow, smiled as she said to herself, "My pupil is in a fair way to knowledge, standing thus hand in hand with good Dame Nature and the wise Lady Science."

CHAPTER I.

MISS BUTTERCUP.

"The wise read Nature like the manuscript of Heaven,
And call the Flowers its poetry."

—*Willis.*

THE next morning, when Rhoda awoke, her first thought was for the strange yellow governess, who was to give her her first lesson in Botany. She had told her younger brother, Hugh, as a great secret, of her meeting with the kind, beautiful strangers over night, and though Master Hugh wasn't quite sure he'd care to learn about the flowers, he said, he would rather have learnt about *fruits*, yet he promised to accompany Rhoda for her first lesson.

"I must take this with me," said Rhoda, taking up the little book which her bright-eyed friend of yesterday had given her, "but I'll have as little to do with it as possible, for I am sure it will be much better fun learning everything from the dear little flowers themselves."

But things are apt to turn out differently from what we expect, and so it happened that many a time Rhoda was very glad to turn to the book of Science to understand certain hard words which little Miss Buttercup used so naturally herself, that she took it for granted Rhoda must know what she meant, and never stayed to explain them. And this happened at the very onset of the lesson.

"Well now," began Miss Buttercup, "I have been thinking that, although various other flowers have received orders from Dame Nature to teach you in turn about themselves, mine will really be the hardest task of all, because you see at first starting you will have to learn all about the different parts of a flower, which, when you have once mastered, will make it much easier for you to learn about my brothers and sisters. So you mustn't lose heart if these first lessons do seem rather hard. You'll have a bit of a hill to climb at starting, but the smooth part that will come afterwards will be all the pleasanter in consequence, and I'll make it as easy as I can to you."

"Of course," went on Miss Buttercup, "you will want to know everything about me: first, to which class in the kingdom of flowers I belong; then the name of my tribe; then my family name, for Buttercup is no more

the whole of my name than I suppose Rhoda is the whole of yours.

"Then, after that I will, so to speak, pick myself to pieces, and tell you the proper names and the uses of everything belonging to me, from my tiny white roots up to my beautiful golden dress, and I am sure you will be quite surprised to learn what a number of different parts go to make up only one little buttercup. Now, to begin with, I suppose you can see for yourself that I belong to the Dicotyledon class?"

"Oh, but that's a very long word," cried Rhoda, "and I don't know what it means, and I can't see anything on you or about you that looks at all like it."

"Well, but look at my leaves," persisted the Buttercup.

Rhoda did look at the leaves, but she only felt the more puzzled and she was nearly ready to cry when she suddenly bethought her of the little book in her pocket. Perhaps that would tell her something about that horribly long word. And, sure enough, written clearly on the very first page, Rhoda found this explanation:—

"*Dicotyledon* and *Monocotyledon* are the names given to two great divisions in the flowering vegetable kingdom.

Plants are said to belong to the Dicotyledon division or class when they spring from a seed which can be split into two parts, like a pea or bean for instance, and which puts forth two seed-leaves, because *di* means two in Greek, and *Cotyledon* means a leaf.

Plants are said to belong to the Monocotyledon class when their seed cannot be divided into two parts, but consists of one solid grain, like a grain of wheat for instance, and puts forth only *one* seed-leaf, because *Mono* means one, and as you saw above, *Cotyledon* means a leaf.

And without going to their seed, it is easy to distinguish one division of plants from the other by merely looking *at their leaves.*

The leaves of Dicotyledonous plants have little netted veins running over them, like the nettle leaf or the leaf of the primrose, whereas those belonging to the Monocotyledonous class have leaves with veins running side by side with each other in straight lines, like the leaves of wheat or snowdrops."

"Dicotyledon, Monocotyledon," spelt Rhoda to herself, "well, those certainly are hard words to begin with, but perhaps if I say them over several times every day I shall get used to them. Still, for common use, I shall say 'crooked veins,' and 'straight veins,'

and *I* shall know what I mean, if nobody else does. And I advise you, Hugh, to do the same," she added.

"Oh, bother," said Hugh. "I don't see why flowers should be put into classes as if they were fellows at school. Please, Miss Buttercup, let's hear about your tribe now, I hope that's not got quite such a long name."

"It's not a very short one," was the reply, "for I belong to the Ranunculus tribe."

"We shall *never* remember that," groaned the children.

"Oh! yes, you will. You only want to grow used to it and then it will come as easily to you as Algernon or Reginald, or any other long name that you've heard often enough to make you forget how long it is. You had better call me Miss Ranunculus, I think. It will fix the name of my tribe in your heads, and besides, it is more respectful. Buttercup is only a pet name after all and, like all pet names, there is not much sense in it."

"I'm sure there can't be any in Ranunculus," pouted Hugh; but apparently, the little yellow-faced governess did not hear his remark, for she went on to say:—

"You'll soon find out that the tribe name of flowers tells you a good deal about them in one word. Now, Ranunculus for instance, means a little frog. Well, you

open your eyes and you think to yourself that I don't look much like a little frog, but I *am* like one for all that, and most of my brothers and sisters are even more so than I am. And I'll tell you in what we're like them. A frog loves to live in damp places and near the water side, and so do we, when we can get there. So our tribe is called the frog-tribe amongst flowers, and though to be sure, I grow very prettily in the green meadows, yet those of my relations who live nearer the water have flowers and leaves twice my size, because folks always do better in the place for which Dame Nature intended them. Well, now, what did I say is my tribe name?"

"Ran, ran," began both Rhoda and Hugh, and then both stopped short.

"Unculus, unculus," added the small buttercup rather impatiently; "very well, then, we have got so far, you have learnt that I belong to the class of Dicotyledons—"

"Crooked veins," muttered Rhoda to herself.

"And that my tribe is the Ranunculus tribe," added Miss Buttercup.

"Little frog tribe," muttered Rhoda again.

"Now we come actually to my family name, and that again will tell you something about me. It's all

very well to say I am a Ranunculus, but suppose you wanted to send me a message by one of those white-winged butterflies that are whirling about, and you told him to carry it to Miss Ranunculus, why, the poor fellow would puzzle himself silly as to who out of all the twenty families in the ranunculus tribe was to have the message. But if you said, Miss Ranunculus *bulbosus*, he would know at once it was I who you meant; because I, having what is called a bulbous root, that is a root with little round swellings like baby turnips, am so named to distinguish me from two very near relations, whom you silly children often mistake for myself. These two are the creeping buttercup and the meadow crowfoot, and though their flowers are, I suppose, something like my own, yet *they* only grow from quite common stringy roots. So remember, I am Miss Bulbous Ranunculus, which not only sounds grander than buttercup, but as I've explained to you, has more meaning in it.

My class name, Dicotyledon, tells you about my seed; my tribe name, Ranunculus, about my habits, and my family name, Bulbous, about my roots.

And now, as small heads can't carry too many new ideas at once, I think we'll leave off for to-day, and don't be discouraged because it has been rather hard

work, for all you have learnt to-day, will be, you will find, quite a sort of little key to the secrets of the other flowers about which you will learn in time."

Part II.

"Well," said Miss Bulbous Ranunculus on the following morning, "the last thing we talked about yesterday was my root. Now, what use do you suppose my root is to me?"

"I'm sure I don't know," said Rhoda, "for it is hidden away down in the ground, and you can't even see it yourself."

"The use of the roots of all good, steady-going plants," said Miss Buttercup, "for I don't speak of certain flighty things who don't seem to know if they stand on their head or their heels, and actually have their roots in the air*—is first, to keep the plant fixed in the ground, and then to draw up so much moisture from the earth, as to enable it to act as a regular water-cistern to the plant. There are very many different sorts of roots, about which you will

* Miss Buttercup was thinking of some members of the Orchis family, who have their roots in the air, as well as of some kinds of ivy.

learn by-and-bye, all I shall tell you about my roots now, is that they are bulbous, that is, if you were to dig me up from the ground I should have little white, hard, roundish knobs for roots."

"Oh! yes, I know," interrupted Hugh, "nurse calls them St. Anthony's turnips. St. Anthony was an old hermit you know, who lived ever so long ago, and he used to make his dinner every day off your roots."

"Then he must have made himself very sick every day," answered Miss Buttercup, and her tone was rather fractious, perhaps because she was afraid that her pupils might gobble up her roots by way of following that ancient man's example. "But let me go on with what I was saying. Like most roots, mine is made up of two parts. The solid part, which you call like turnips, and the little threads which spring from the thick part of my root, and which are really the most important part of my plant.

"For these tiny root hairs have little mouths which suck up the moisture from the ground, which is so necessary for the support of my plant. And you must remember this, because in every other plant you will find these useful little root hairs, and you can understand now, that although, as you said just now, our

roots are hidden out of sight we should very soon perish without them.

"If ever you have been mischievous enough to pull up a plant out of a hedge only for the sake of throwing it down again on the bare hard road, where the poor little mouths in the root were scorched by the broad sunlight, and where they couldn't possibly suck up any moisture, you must have seen for yourself how soon the leaves and flowers withered, and how the roots—those poor little water-carriers for the whole family—shrivelled and died.

"And now we come to my stem, or as you call it, I daresay, my stalk. There is a great difference in stems. Some grow up tall and straight like the Foxglove's; some are so lazy that they sprawl all their length on the ground, like the Ground-ivy; some wreath themselves about, like the blue-eyed Periwinkle; whilst others will climb ever so high, over hedges and walls, putting out tiny green arms to help themselves up, as you see the ivy will do. Then, too, there is a great difference in the *shape* of stems. Some are nearly flat, some are round, some have a channel running down them. Some are four-sided and some are knotted, as you may notice in the stem of the little wild cranes-bill,

or in the stem of the pinks which grow in your gardens.

"Then there is the *covering* of the stem to be considered, for that teaches you a great deal about our natures. Some are quite smooth, like the stalk of a violet; others are hairy, like my own stem; others have prickles, like the blackberry; others have stains, like the hemlock.

"Now what you have to remember about my stem is, first that it grows *upwards*, that its shape is *channelled*, and that its covering is *hairy*.

"And now, having given you the description of my little stem, I will tell you its history. When my plant was quite, quite in its babyhood, that is when it lay wrapt up inside my seed, it put out two thin shoots from each point of the seed. Now these two small shoots are like two little brothers, who are born in the same home and nursed in the same cradle, and who, yet, directly they come out into the world, part company and go exactly opposite ways. For whilst one of these little shoots or fibres runs down into the earth, hiding himself from the light and air, and turns into my root, the other, on the contrary, pushes himself upwards, seeking all the light he can find, and struggling to warm his tiny head in the sunshine.

"And this fibre grows into my stem, and does the part of a good hard-working father to my plant, for first he pushes his own way bravely in the world, and then takes upon himself to support my leaves and flowers and to supply them with all the necessaries of life.

"And now we will pass on to my leaves. You would be quite surprised if I were to tell you half of what there is to be learnt about leaves, but I'm not going to puzzle you with long names and explanations to-day, because it is better to learn things by degrees, and as all I am teaching you now is quite new to you, it will be better to leave much that may be learnt about leaves to the other flowers to teach you.

"By-and-bye, perhaps, when you are older, you will learn what clever little cooks and chemists we have in our leaves, how they take up from the air just the food materials we want, and distil them and cook them and dish them up for our wholesome feeding. And it is not only a great part of our food that we get from our leaves, we have to thank them as well for supplying us with air to breathe, for every leaf is what is called an organ of respiration, which means that it is a breathing mouth to the plant. If you were to see the surface or upper part of any leaf

under a magnifying glass, you would find it full of little cells or holes, through which the plant breathes.

"And besides being so useful to ourselves, leaves are of great use to you two-legged folks, for more than anything else, they help you to guess at first sight the nature of a plant. For there is a wonderful variety in these green breathing organs of ours, which must strike even the most careless observer.

"First there is that great distinction in the *veins* of leaves, of which we spoke yesterday, and which marks the difference between the monocotyledon and the dicotyledon class."

"Oh! yes, I remember that," broke in Rhoda, "those that belong to the first class have straight lines, and the others have crooked lines."

"Quite right," said Miss Bulbous Ranunculus, and her golden face seemed to gleam with satisfaction. "Well, besides that, you can see there is a great variety in the way and position in which leaves grow. Some leaves have a little leg or leaf-stalk all to themselves, branching out from the principal stem, like a nettle leaf, for instance; others grow so close to the stem that they are called *sitting leaves*—you can see them any day in the speedwell plant—others, like the leaves of the thistle, not only sit close to the stem,

but actually embrace it, so that the stem is completely surrounded by the leaf.

"Then, too, some leaves are glossy, like the holly's; some are leathery, like the leaf of an oak; some are downy, like the leaves of the wound-wort; some are limp and soft, like my own.

"And if we once began to talk about the many different *shapes* in leaves, we should not have done by sunset, so now I will only draw your attention to my own.

"These, as you can see, are cut into three stalked leaflets, and fall about my flower-stem as gracefully as if they were a kind of lace trimming. When leaves are cut like mine, they are called *partite*, because you see, Dame Nature, instead of making them all in one piece, like a dock leaf, for instance, has taken up her scissors and notched my leaves so deeply that she has cut them into several parts, so as almost to make one leaf into three separate ones. Ah!" broke off Miss Buttercup suddenly, "I see you are both yawning, which means to say that you have learnt enough for one day."

"Oh! yes, please, we're quite sure that we have," said Hugh.

"Very well, then; only before you run away,

just tell me if you can, about how many of my parts you have heard to-day, and the names of those parts."

"Oh! I'm sure I don't know," said Hugh, rather crossly, but Rhoda, after thinking for a minute, exclaimed, "Why, after all, though it has been such a long lesson, we have only been talking about three parts of you, Miss Buttercup."

"Miss Bulbous Ranunculus," corrected the little yellow governess. "Yes, about the three parts, you are right, and they were my root, my stem, and my leaves. Now, why is my root called *bulbous?*"

"Because, oh! I know," said Rhoda, "it has little white knobs in it, like baby turnips, and I remember about your stem. It grows upright and has little hairs on it."

"And," added Miss Buttercup, "is called channelled, because it is dented in down the middle. And now why are my leaves called *partite?*"

"Because Dame Nature notched them into three parts, so as almost to make three leaves out of one," said Rhoda. "We will try and remember all about that, and now I do hope to-morrow that I shall hear about your beautiful golden dress and short green upper petticoat. I never did think it would take such a long time to get there."

Part III.

"So to-day we are to hear about the prettiest part of you," began Rhoda next morning, "and I suppose you'll tell us first about your green upper skirt."

"Which we will call by its right name at once," answered Miss Bulbous Ranunculus, "and that is calyx."

"What a funny name," thought Rhoda; "I suppose that's how the flowers call their upper skirts, but I'll see if there is anything about it in Lady Science's book."

And sure enough she found there, that calyx was the Greek word for cup. And so it has been given to that part of a flower which serves as the outer covering to the blossom, and acts as a little cup to hold the flower.

"Oh, I understand now what a calyx means," said Rhoda, looking up from her book; "do you see, Hugh, it means a flower-cup, but I think, Miss Buttercup, it is rather like a petticoat all the same."

"Well, and it rather does the work of a petticoat," said Miss Bulbous Ranunculus, "as you will see when I show you the use of it. Now, first you must notice that my flower-cup is cut into five divisions.

These divisions are called sepals, or separations. And as you see these sepals at this moment surrounding my flower, they certainly do look, as you said just now, like a green petticoat; but now, if you look at this baby buttercup,"—and she pointed to a small tightly-closed green bud—"you will see that before our flower opens and becomes full grown, the sepals of the flower-cup are much longer than the flower itself and so serve as an outside covering and protection to the baby bud. Indeed, they act as long clothes to the bud in its infancy, turning themselves backwards and gradually becoming shorter as the flower grows older and larger. Then in fact it is short-coated. And it is the same with calyxes as with leaves and stems, there is no end of variety in their divisions, their position and even their colours. The calyx of the pale-faced cuckoo flower for instance, has only four divisions, and in that of the golden gorse you will find but two.

"But to return to my own flower-cup. If you examine my sepals, you will see that they are unlike those even of my nearest relations, being what are called *reflex* or turned back sepals. That is, instead of turning upwards and embracing the flower, as is the way of most sepals, mine turn downwards. This

marks at once the difference between me and my two half-sisters, the creeping buttercup and the meadow crowfoot, with whom ignorant people so often confound me."

"And now, please, isn't it time to talk about your flower itself?" asked Rhoda, who thought she must have reached the easiest as well as the prettiest part of her lesson.

"Yes, we *have* come to it at last," said Miss Buttercup, "and now you must know that the real name of my beautiful yellow dress, as you call it, is *Corolla*, which means a little crown. My little crown you see, may be said to have five spikes, for it is divided into five parts, each of which is called a *petal.**

"These golden leaflets of my corolla are arranged in turns with the green leaflets of my flower-cup, so that if you were to take my blossom and hold it topsy turvy, you would see that each space left between two green leaves or sepals of my calyx was filled up by a yellow leaf or petal of my corolla. Now look at my petals and you will see that they are not the same on each side; for whereas their outside is of a dull yellow hue, their inside is of a bright glossy golden colour.

* "Petals," said Lady Science's book, "comes from a Greek word, which means spread out—πέτᾶλος πετάννυμι."

Nor is this the only difference between the inside and outside. Although the surface of both is equally smooth, at the bottom of the inside of each petal you will find a tiny swelling. This is called a *nectary*, or storehouse for honey, because it is the little case which holds all the honey of the flower. The bees know all about that, I can tell you.

"So much for my golden dress, then, which you see is not only beautiful, but has its uses too. And now we come to what is inside that golden dress, or corolla. And you must pay attention to what I am going to tell you about that. Look, first of all, at that crowd of thin yellow spikes with their thick, club-like tops. There is such a number of them that it is no good trying to count them. They stand in a ring like a regiment of little yellow soldiers set to guard the green-raised knob in their centre. This green knob, which looks very like a small unripe strawberry, is placed along with his body-guard of little yellow spikes on the top of my flower-stalk.

"These spikes are called *stamens*, you know."

Between you and I, my readers, Rhoda did not know at all, and both she and Hugh would have been dreadfully puzzled to guess the meaning of the new word if they had not found out in Rhoda's

useful little book that *stamen* was the Greek word for *thread.*

"Now," went on Miss Buttercup, "if you take one of these yellow spikes and examine it, you will see that each of their thread-like little stalks ends in a blunt top like a fairy club. Or perhaps I should rather say a fairy purse, for it is in fact a tiny pouch, or purse, with two little slits in it. Each of these fairy purses is filled with a golden dust called pollen, or flour. It is from this pollen that we make our seeds. For as soon as my flower is fully grown, these tiny pouches open of their own accord and scatter their precious dust in a golden shower on the green knob in the midst of them, whose business it is to superintend the making of our seed.

"But when the time has come for all this to happen," went on Miss Bulbous Ranunculus, "my beautiful petals are already beginning to wither, and the one green spot in my centre which once looked so small, is growing larger and larger, fed as it is by the rich golden flower-dust, which my stamens have showered on it."

"But please tell us about that little green knob

which has such a grand body-guard of its own," said the children.

"Ah! we Buttercups are very proud of our centres," was the reply, "for as you will see when you become intimate with other flowers, we have much more to boast of in that respect than most field-folk. Many blossoms, like the cuckoo flower for instance, and others of her tribe, have only what is called one pistil or tube. This generally stands in the middle of the stamens like a solitary little column, and consists of three parts. The ovary, or seed-vessel, which answers the purpose of legs on which he stands; the narrow, thin tube which is called a style,* and which connects the seed-vessel at the bottom of the pistil with the stigma or point of the style in which the pistil ends, which forms the third part. Now the special business of the pistil is to do the duty of treasurer; that is, he receives upon his point or stigma the valuable gold dust from the common workers—the stamens—round him, and passes it along his style to the seed-vessel on which he stands, and where it is coined into the seed, of which we shall speak presently."

* "Style," whispered Rhoda to Hugh, peeping into her book, "is from a Greek word again, and means something that supports something else."

"And very hard work this solitary pistil must have, I should think."

"But we Buttercups you see, instead of having only one officer for this important work of collecting the pollen and storing it away, have quite a large staff of these upper servants, packed close together one upon another on that little green knob. And instead of calling them pistils, *we* call them *carpels.** It is these carpels which make up the little green berry which you will see some day remaining on my stalk long after my bright golden face has vanished away. For this green berry will consist of many closely-packed little flattened green bodies in shape rather like an egg, with a tiny curved hook at the tip of each. This hook is the remains of our style and stigma. Now to ignorant folk these small green grains would look like unripe seeds, but they are no such thing. Each of these fairy beads is a carpel or seed case, which contains inside it one minute pale grain, which is fastened to its green covering by a thread so very small as to be almost invisible.

* Carpels are a kind of hollowed leaf which act as coverings or cases to the seed within them. They are so named from a Greek word for *fruit*.

"But slender as this cord is, it is of the utmost importance to the baby seed, for it acts as a sort of feeding-tube to our infants, supplying them with the nourishment they require to keep them alive in their little green prison. Or, I really ought to call it a nursery, for like tenderly nurtured infants, my baby seeds lie wrapped up each in his own green blanket, carefully shielded from all cold winds and driving rains, and fed by that tiny white thread of which we have just spoken. And here they lie in safety till such time as the grain is ripened, then the seed-vessel and the little seed along with it drop to the ground, and the falling rain and dews, gradually wearing away the outer covering, at last release the seed from its case and leave it to make a home for itself on the breast of our kindly Mother Earth.

"And Dame Nature knows she is quite safe in entrusting her children to the care of this old, old nurse, from whose sheltering lap they will rise next year each one of them into buttercup plants, with glossy, golden blossoms and lacey green leaves, just like the parent plants from which the seeds were formed.

"So here we are at the end of our story. But before you go, I want to give you the names of some other members of my family, whose acquaintance you may

probably make in your fields and lanes. I have a great number of near relations, and some of them have white petals instead of golden ones like mine.

"Now, here are the names of some with whom you are most likely to meet:—

"1. The creeping buttercup, with glossy yellow flowers and a creeping root.

"2. The meadow-crowfoot, with golden blossoms like my own, but a rounded stem.

"3. The ivy-leaved-crowfoot, with yellow flowers, but round leaves instead of notched ones, and growing in shallow streams and damp spots.

"4. Great spearwort. Very like me, except in his long spear-like leaves. Loves the river side.

"5. The lesser spearwort. Like his larger brother, but with much smaller flowers.

"6. The pilewort, with bright glossy golden flowers, and heart-shaped leaves.

"7. The wood crowfoot, whom you children sometimes call 'goldilocks.' Very much like myself, only with smaller blossoms, and growing in a straggling fashion.

"8. The celery-leaved crowfoot, with smooth leaves and hollow, juicy stems; the pale yellow flowers are very small.

"9. Pale, hairy buttercup, so-called because his flowers are paler than mine, and his leaves and stem very hairy.

"10. The corn crowfoot, with mean little dull yellow flowers, and easy to distinguish from the rest of its family by its large prickly carpels.

"11. Small-flowered crowfoot, a lazy lounging thing, with little yellow flowers. Fond of sprawling over meadows.

"12. This is the glorious marsh marigold, sometimes called the 'Water Dragon.' He is the king of our tribe, with his handsome straight stem, and beautiful golden, starry flowers. You may look for him in swampy places as early as February.

"13. The water crowfoot, who, as his name tells you, lives in the water. His petals are white instead of yellow, and his floating, rounded leaves are notched in three divisions. And now for the last of my relations of whom I am going to speak to-day, and this is none other than the pretty pale-faced wood-anemone, the wind-flower as she is often called—with her daintily cut leaves and graceful, slender stem, which look too delicate to bear a breath of rough wind.

"My grand garden relations, no doubt you know already. All the smart family of the Anemones with

their purple and pink and white and scarlet dresses, as well as the Bachelors Buttons, and all the different garden Ranunculuses.

"But now I have said my say, and a very long say it has been, and my good friends the cross-bearing tribe must be longing, I am sure, to hear *their* lecturer begin. So I would advise you to stop halfway on your road home and take a lesson from a rather aristocratic member of their tribe, Mr. Cheiranthus by name, known to you as a wall-flower. He grows on a rugged bit of wall not far from here, and I daresay he'd teach you very well, though he is rather a dull thing to look at. And now, good-bye, little people. I'm afraid my lesson has been rather dull and hard, but I hope I've managed to awaken enough interest to encourage you to go on learning from other flowers of the field."

Herewith, Miss Buttercup dismissed her pupils, but before running after a fresh teacher, Rhoda wisely tried to fix in her memory what she had already learnt by reading over in Lady Science's book, this little notice, which she found there concerning the buttercup:—

BUTTERCUP.

Class, dicotyledonous; *tribe*, ranunculus; *family*, bulbous.

Root, bulbous; *stem*, channelled, hairy; *leaves*, deeply notched, called partite.

Calyx, green, divided into five reflex or turned back sepals.

Corolla, divided into five petals, each petal having a little lump at the base of inside, called nectary.

Stamens, numerous.

Central organ. Numerous carpels or small green pods, each containing one seed.

Moreover, Lady Science added something more to the description of the buttercups in general, which, *perhaps*, Miss Bulbous Ranunculus had forgotten to remark upon, and which Rhoda's bright-eyed friend mentioned now, not from any ill-natured feeling against that golden-faced family, but merely for Rhoda's and Hugh's protection. And this something was the following warning:—

"Be very careful not to chew the leaves and flowers of any of the ranunculus tribe, for, except the water-crowfoot, they are all in a more or less degree highly poisonous, both to humans and cattle."

CHAPTER II.

MR. CHEIRANTHUS, COMMONLY KNOWN AS WALL-FLOWER.

"Like banner of Crusader old,
My cross-shaped petals I unfold."

Neal.

HE certainly *was* rather a sober flower to look at, that rusty-coloured wall-flower to whom, a few days later, the children went on Miss Buttercup's recommendation. He grew in the crevices of a tumble-down stone wall, which, perhaps, had formed part of some stately building in such long, long ago days, that there was no one living now who could guess when and why those rugged grey stones had ever been put together.

"So my small sunny-faced friend yonder has sent you to me," said the Wall-flower, nodding towards the meadow where the buttercup dwelt. "Well you've been taking such very long lessons of her, that I

suppose you've learnt something about us flower folk?"

"Oh, yes," said Rhoda; "only Miss Buttercup told us *you* were in no way related to her."

"*Related to her;* I should think not, indeed," retorted the Wall-flower, "why I am the head and captain of the great cross-bearing tribe, and now-a-days, if I chose might disclaim all connection with any field flowers. But I'm not ashamed of my kith and kin, and, to tell you the truth, I have kindlier feelings towards those homely members of my tribe, like the pale-faced cuckoo-flower, and the honest, though rather strong-tasted, "Jack by the Hedge," who are content to fill the humble places where Dame Nature has put them, than I have for any of those gaudy stocks or the double wall-flowers. These have pushed themselves into fine gardens, and have grown smart and have doubled their blossoms, till they have actually hidden all trace of our distinctive mark, the cross-wise arrangement of our petals.

Of course, as regards the buttercup, there can be no relationship between us, for she belongs to the Ranunculus tribe, whilst I am chief of the cruciform or cross-shaped tribe; yet for all that, there *are* one or two points of resemblance between us, which,

perhaps, you may find out as we go along. In the first place, should you say now that we belong to the same class?"

"Yes, you are like the buttercup in that," said Rhoda, "for your leaves have the crooked veins in them, and therefore you must belong to the plants who have their seeds in two bits."

"And which," went on her new teacher, "is called the class of dicotyledons because——"

"O! I know that," said Hugh, "*di* means two, and that other long piece of word means seed-leaf, because when a seed is in two bits, each bit of the seed puts forth a leaf."

"Well, yes, that will do," said Mr. Wall-flower, "and having settled our class, we now come to my tribe. That is called the cruciform tribe or the tribe of the cross-bearers, because, as our name might almost lead you to guess, our blossoms are arranged in the form of a cross. Look at the four petals of my corolla,"—how glad Rhoda was, that she knew by this time that corolla meant the coloured part of a flower—"and you will see that they exactly make a cross. And except in those double garden stocks and wall-flowers of which I spoke just now, you will find that all we cross-bearers are alike in

having neither more nor less than four petals to each flower.

"This will serve as a guide to you in tracing out my many relations, for many I have indeed, my tribe containing not less than thirty-three different families in this country. Except those smartly-dressed garden deserters of whom I just spoke, we are as a tribe by no means remarkable either for the size or gaudiness of our blossoms, but yet we are of almost more use, both to men and cattle, than any other tribe.

"Ah! you look surprised," went on the Wall-flower, "but you're only like all the rest of the world, who, every day, take good gifts as a matter of course, and never trouble themselves to ask the name even of those who provide them.

"Now, suppose, as a reward for your ingratitude, all the members of our tribe who live in your gardens and fields, should agree to walk away elsewhere, what do you suppose would happen to you then? I'll tell you. You of the two-legged tribe, would have no more nice sea-kale for dinner, no more brocoli, no more scraped horse-radish, no more fresh watercress to eat with your bread and butter, and if you happened to have mustard and

cress sown in your garden, in your own name perhaps, or pretty pink and white radishes to be pulled in due time for nursery tea, you would find that they had all vanished along with their brothers and sisters of the cruciform tribe; and what would the sheep and cows do without their turnips, do you think? and how would the pigs get on without any cabbages?

"There now, I think you'll begin to understand that we are rather an important tribe, and worth learning about."

"Oh! yes," said Rhoda, who was quite astonished at all she heard; "and then, please, have you a family name, Mr. Wall-flower?"

"Well, well," and the Wall-flower stopped short for a moment and hesitated; "there is a little doubt about the meaning of my name. The truth is, it is an Arabic word, Cheiranthus, which means—which means—all sorts of beautiful things!"

"Oh! but what sort of beautiful things?" cried both children, eagerly.

"Ah! well, never you mind now," said Mr. Wall-flower; "all you have to remember is that as it is an Arabic name, it proves that I and my family must have been Arabs once, so now whenever you hear

my name, you'll recollect that it tells you that I came from the land where the spices and palm-trees grow. And now I'll wind up to-day's lesson by asking you a few questions, to see how much you remember of what you have heard.

"First of all, what is my class?"

"Oh! the same as Miss Buttercup's," said Rhoda, who, truth to tell, shirked saying the long word.

"Yes, the Dicotyledon class," said Mr. Wall-flower; "and what does that teach you?"

"That your seed being in two parts, puts forth two seed leaves."

"Now tell me the name of my tribe."

"Cruciform," said both children, "or cross-shaped, because your four petals are arranged in the form of a cross."

"Good children; and you remember that there are thirty-three different families contained in my tribe; and now what is my family name?"

"Oh! something, something," said Rhoda, "which says that you came from Arabia ever so long ago."

"Cheiranthus," said the Wall-flower, with a grim smile. "Well, now you see my class name tells you about my seed, my tribe name about my shape, and

my family name, the land of my birth. Yes, you may be off now."

Part II.

"Please may I call you Mr. Wall-flower?" asked Rhoda, next morning; "your other name is so dreadfully long."

Mr. Cheiranthus gave a grim little chuckle. "Well, if you like, you may call me by my work-a-day name," he said, "as long as you'll try and remember when you see Cheiranthus honourably mentioned in books that that's me. For my own part, I confess that I love the good old name of Wall-flower. It has been in the family ever since the days of my ancestors, when gallant troubadors sang about the Wall-flower to their ladies gay. But now for our lesson," he continued, changing his tone. "I shan't tell you much about *my* root, because, although if I chose to puzzle your little heads, I might explain to you no end of wonderful contrivances which are to be found in that tuft of colourless threads which I call my root, those are intricate details which you must learn for yourselves later. So all you need remember about my root is, that it consists of a number of slender whity-

brown strings, called fibres, and which act, partly as so many small legs to keep me steady amongst these crumbling stones, and partly as so many mouths to suck in all the nourishment they can secure from the not very bountiful soil where my lot is cast."

"Oh! I'm glad that your tribe has such nice, sensible roots," cried Rhoda. "I mean roots that are so easy to learn about; for I think that they are quite the dullest part of a plant."

"Wait a bit," said Mr. Wall-flower. "I said *my* roots, because I meant my own especially. The roots of some of the members of my tribe are quite a different thing. There are some of those about which I don't think you'll find it such dull work to learn. Come now, you've never considered those long, pink, taper radishes such particularly dull things to think about. Eh? or their round, plump little red and white cousins either? And I'm sure you," looking at Hugh, "have often been glad enough of the root of another member of my tribe, when you've wanted a lantern all of your own making, and have chosen some specially fine turnip to hollow out for the purpose.

"And in these sort of roots you can see very clearly that they are made up of two parts, the thick or fleshy part which is called the *body*, and the little

threads which sprout out from the solid part, and which are called the root-hairs.

"I, you see, have to content myself with nothing but threads of different sizes, which proves, you know, that amongst us cross-shaped flowers, however much our blossoms may be all cut on the same pattern, there is plenty of variety as far as our roots go.

"And now for my stem, whose duty is to make itself generally useful in supporting my leaves and blossoms and supplying them with meat, drink, and air.

"My stem is, as you can see, upright and smooth, having no hair on it, for instance, like my cousin of the cuckoo flower family, the hairy, bitter cress; and its shape, though a careless observer might describe it as almost round, is really four-sided. Remember this last fact, as it is a common feature in the stems of our tribe. Then, also, you will observe that it is what is called *branched*, that is, instead of bearing only one flower, like the daisy, for instance, or one flower and leaves like the milkwort, my stem has several branches, all of them bearing leaves and flowers. Well," broke off Mr. Wallflower, rather sharply, "what are you two chattering about?"

"We were only saying," said Rhoda, "that your flowers grow in such a funny, straggling way up your

stem, that they looked to us as if a party of your flower-buds must have started out on an expedition to climb up to the top of your stem, but as if some had grown sulky or lazy, and so stopped short in different places along your stalk, and the others had all gone ahead of them as fast as they could in a crowd together."

"Well, that's not such a bad description," said Mr. Wall-flower, and his dull rusty petals seemed almost to gleam with amusement; "at any rate I'm glad you've noticed the arrangement of my blossoms, for I was going to point it out to you. When, as in my case, the blossoms seem *straggling*, as you say, that is, when they are so arranged that the lower flowers have long stalks, whilst the upper ones seem almost sitting on the stem, the blossom is said to be arranged in a corymb. Well, what are you poking your nose into that book for?"

"To see the meaning of that funny word," said Rhoda. "Oh! I see, it's from a Greek word that means a peak, because I suppose your flowers run up into a peak."

"Right," said Mr. Wall-flower, "and now remember that as far as I know, and that's a long way," added the ancient gentleman, with a shake of his rusty

blossoms, "that there is not a single member of my tribe, from the grand gay lady stocks in the garden down to the wee white-flowered whitlow grass on the hard bare rocks, who would not be ashamed to wear their blossoms in any other form but a corymb.

"It is true that you will meet with other flowers in other tribes whose blossom is also arranged in the same fashion—the blossom of the white bean, I mean, for instance—but you will never find one of us cross-bearers with flowers arranged in any other form.

"But whilst we have been straying away to talk of my blossoms, we have left my leaves so far behind that it is time we turned back to see after them.

"Now there is such a variety amongst the leaves of us cruciform plants that I can only mention some of them, and the rest you must hunt out for yourselves. *My* leaf is, as you see, oval and narrow and tapers to a point. When leaves are so shaped they are called *lanceolate.*"

"I suppose," said Hugh, "because they're something like the shape of lances?"

"P'raps," said Mr. Wall-flower, rather sharply—he evidently didn't like being interrupted—"then as the edge of my leaf is smooth with no notches in it, it is called *entire.* Now all the Stock family have leaves

like mine, nor are those of the candy-tuft unlike mine in *shape*, though their edges are toothed. But when we come to the leaves of the cuckoo flower and the cress family you will see a change. Look at the leaf of the cuckoo flower. It is notched into ever so many round leaflets, which are arranged on either side of a bit of stalk which runs up the middle of the leaf. This piece of stalk is so like the piece of quill that runs up the middle of a feather, that for that reason, leaves so arranged are called *pinnate*, from the Latin word for feather. But these sort of feather-like arranged leaves you will meet with again amongst the other tribes—the pea flower tribe, for instance—so I shan't say any more about them. The fresh green rounded leaf of the watercress you've eaten often enough to know what it is like, as well as those of the common winter cress, whose leaves are shaped so wonderfully like a lyre that his brother cresses are always asking him to give them a tune.

"Then again there are the broad, heart-shaped leaves of the garlic, "Jack by the Hedge," or "Sauce alone," as those homely folk nick-name him who love to flavour their bread and cheese with his strongly-veined, deeply-toothed leaves. And besides all these, there are the leaves of the mustard family, mostly

rough and hairy, and very different again in shape and feel to the cabbage and the sea-kale leaves. For these latter also belong to my tribe, though they are so strangely unlike me.

"Well, we seem to have made quite a round of visits amongst the leaves this morning, don't we? And yet there are ever so many belonging to the cruciform tribe whom we have passed over. You must try and call on them by yourselves by-and-bye. Now, I only want you to tell me one thing, and then we shall have finished lessons for to-day. How are my blossoms arranged on my stem, and what is the arrangement called?"

"Oh! we know," answered Rhoda and Hugh together; "they straggle up your stem, and some have long stalks and some have hardly any at all, and they are said to be arranged in a corymb, which is a Greek work meaning a peak. And so the next time we go to Malvern and see a party of people climbing up one of the peaks, and some going on in front and others lagging behind, I shall say they must belong to the cross-shaped tribe, because they are straggling up the hill in a corymb."

Part III.

"Ah!" said Mr. Wall-flower next morning, "You've come earlier than usual to-day, because, I suppose, you are hoping to hear about my gay, showy, petals."

Rhoda laughed, for she thought to herself, "I suppose its natural he should think his own clothes so fine, but I shouldn't like such a rusty colour for *my* frock, unless I wanted to dress up for a fancy ball as Jenny Wren, in a 'plain brown gown,'" but she kept her thoughts to herself—and only said, "thank you, I should like to hear about your petals."

"Yes," was the reply, "but first you must look at the flower-cup which holds them, and which I suppose you know is called a calyx."

"Oh! yes," said the children, "we learnt all about that from Miss Buttercup."

"You learnt all about *her* calyx, I daresay," retorted Mr. Wall-flower, "but mine is very different from hers; can't you see that for yourselves?"

"Well, yes," was the answer, "her's was quite green and yours is brownish."

"True, but there's a much more important dif-

ference than that between us. Come now, into how many different sepals or bits was Miss Buttercup's calyx divided?"

"Into five bits," said Rhoda, "at least, I think so."

"You need'nt *think* about it, you ought to know it was," said Mr. Wall-flower, rather sharply.

"Well now, without thinking or knowing about mine, you need only *see*. Is mine in five bits?"

"Oh! no, I see now," cried Rhoda, "your calyx has only four sepals. Is it made so to match your petals."

"I suppose so," said Mr. Wall-flower, "for a calyx with four sepals is as much the badge of our tribe as are the four petals of our corolla. Now look at this bud of mine. Here you will see my calyx fulfilling one of its chief duties, namely, that of sheltering the baby flower within it. The four brownish leaflets of which my calyx is formed, cover over my bud completely, fitting most neatly at the edges.

"But observe one thing, the divisions of my flower-cup are not alike in size or shape.

"One pair of sepals are long and broader than the other pair, and where they join the flower-stalk, they have a swollen look. These latter are placed

opposite to each other, the two smaller sepals standing alternately between the two large ones.

"Well, I see you want to ask me a question, what is it?"

"It's this," said Rhoda, "Hugh and I can't agree. I say you are a garden flower, and Hugh says you must be a wild one, because you don't grow in a garden. Please which are you?"

"That depends what you mean by being a wild or a garden flower," was the answer. "I don't grow about in hedge-rows and lanes, and I'm not such a savage that I should feel ill at my ease in the grandest garden, for a well-bred gentleman like myself would feel himself perfectly at home in a monarch's button-hole, so I'm not a wild flower in that sense; but if on the other hand, by being a garden flower, you mean that I would choose to live cramped up in some narrow border, forced into the society of those showy, upstart annuals, who always try to tread on the heels of the old flower-world aristocracy, and subject to being clipped and cut down when the gardener has no better use for his scissors, then I say, 'no, give me the glorious independence of a wild flower, and let me unfurl my cross-shaped banner on these old grey stones, a little

higher in the world as to position than the low-growing hedge and field folk, and free from all annoyance from gaudy upstarts and trimming shears!'

"I have a half-brother, it's true, a wild young fellow, whom you may meet perhaps by the sea shore, for he once had a fancy to go to sea, though he never got further than the cliffs. You'll know him at once, for only a half-brother of mine, for *his* petals are only a plain yellow, not a rich velvety brown like mine.

"But now, having chattered enough by the way, let us examine my corolla.

"It is, as you see, divided into four petals, and the shape of the petal is rather curious, for whereas the upper part is a rounded outspread leaf, it narrows suddenly till it becomes quite thin and stalk-like where it fits into its place in the calyx.

"The round upper part is called the limb of the petal, the thin part is the claw.

"The petals of your garden pinks and carnations have just such claws.

"Well now, I suppose Miss Buttercup introduced you to quite a crowd of little yellow spikes standing up in her centre, and she told you they were called stamens, which means what? Can you tell me, I wonder?"

"Yes," said Rhoda, "it's the Greek word for thread, because they're such thin little things, though they are rather thick at the top."

"But you mustn't talk of the *top* of a stamen," said Mr. Wall-flower, "it has its own name, which, if you haven't yet learnt, I will teach you now. The top of a stamen is called an *anther*, from the Greek word for a flower."

"Then is that the regular name for the little purses or pouches that each stamen carries on his head?" asked Rhoda.

"Yes, and did you learn what was contained in that tiny purse?"

"Oh, yes," was the ready answer, "the golden flower dust called pollen, and we learnt too how when the right time has come, those little pouches will open of their own accord and let fall the precious flower dust."

"Exactly," said Mr. Wall-flower, "but now whereas you saw a great crowd of these yellow spikes in the middle of the buttercup, how many do you see in the centre of my flower?"

"Why only six," said Rhoda, "and they're not all the same size. Four are taller than the other two, and sit huddled up together round that little

tube in the middle, whilst the two short ones stand away from the rest as if they were sulking."

"Sulking indeed!" retorted the Wall-flower, "that's the kind way in which the world judges those folks who keep themselves in the background because they have more real hard work to do than their brethren. For these two stamens whom you suppose to be sulking are just the most hard-working pair of the lot, and the reason why they look shorter than the others and cannot keep up with them is this, it is their duty to carry all the honey of my flowers, and, poor things, they simply bend under the weight of their load."

"Nonsense," said Hugh, very rudely. "If they've got such a load to carry, I should like to know where they put it, for it's nowhere to be seen, I'm sure."

"Isn't it?" retorted Mr. Wall-flower. "Don't you remember when we were examining the sepals of my flower cup, I pointed out to you that the two larger ones looked very swollen at the base, where they joined the flower-stalk. Well now, if you were to take away my petals and my calyx, and were to look carefully at my stamens—which, like those of the buttercup, are placed on the swollen top of

my flower-stalk—you would see two small glands or lumps inside those large sepals. Now these, like the sticky lumps you saw inside the buttercup petals, and which you learned to call nectaries, or honey storehouses, do the part of honey-jars to my flowers. It is these honey-jars which make those sepals bulge out, just as I have sometimes seen little folks' cheeks bulged out when they have had a big sugar-plum inside their mouths. The other stamens have also a little share in the honey business, but the four have only two small jars to look after amongst them, so each pair takes one gland or jar between them, and they make very light work of it. *They've* no need to bend under their burden.

"And now we come to what wise folks call my central organ. Is that like Miss Buttercup's?"

"Oh! no," said Rhoda. "She had a real heap of little green servants—quite upper servants she called them—but then she told us, that in that respect she was much grander than the cuckoo flower tribe, for instance, who have only one hard-worked servant to collect all their flower dust;" but here Rhoda suddenly stopped, for all at once she remembered that that elderly teacher with his copper-coloured blossoms, who was frowning down at her from the

wall, belonged himself to that tribe who were said to overwork their solitary upper servant.

"Hardly worked, indeed!" echoed the Wall-flower, scornfully, "let Miss Buttercup take care that too many cooks don't spoil her seed between them. Now just look at my pistil, does he look overworked?" and Mr. Wall-flower drooped one of his blossoms so that Rhoda could see the pistil for herself. And certainly that firm, sturdy little column standing in the middle of the four stamens, and a little shorter than them, did not look as if he were pining away under the burden of over-work.

"What do you observe at the top of my pistil?" asked Mr. Wall-flower.

"I can see that it ends in a little yellow fork," said Rhoda.

"Exactly, and that fork is called a *stigma*, which means a point. Now touch that stigma with the tip of your tongue and tell me what it feels like."

"Oh! its quite damp and sticky," said Rhoda.

"Can you guess why it is made like that?"

"I'm sure I can't," answered Rhoda, "unless, perhaps, that part was left to the last, and it's not quite properly finished off yet."

"Noodle!" cried Mr. Wall-flower, "that reminds

me of what was once said by an impudent swallow, whom I should think must have been hatched in some tailor-bird's nest. 'Depend on it,' said this young green-beak, 'when they were finishing off the inside of that flower, there was not enough lining to go up to the top, or may be they overlooked the last stitches.'

"But there is nothing overlooked by Nature, nor does that wise old Dame ever fall short of her materials. The Hand that made the sticky stigma, made also the six little pollen cases round it, and the great Mind that decreed that new flowers should spring from the seed of old ones, foresaw that, when in due time, the anthers, or flower-dust pouches should open and scatter the pollen within them, the golden flower-dust would stick more easily to the moist stigma than if it were covered with a hard, dry surface. And the reason why the pistil is shorter than the stamens which surround it is also quite plain.

"Being thus placed below the stamens, the flower-dust from their pouches falls naturally on the stigma, when the time comes, of which you spoke just now, for the anthers to scatter their golden pollen, and the gold dust being passed on through my style—you remember that is the name for the thin tube that connects the

top and bottom of my pistil—to the seed-vessel below, begins at once to be changed into seed. But like many who handle precious materials, this part of my pistil does his work out of sight of passers-by; so that when you see him gradually changing his little white tube into a long, thin green case you can only guess, but cannot see, how busily he is arranging his tiny seeds in the inside. This green covering, though it is like a small pod, is properly called a silique or husk, and, by-and-bye, when the seed is ripe, and my silique opens of its own accord to scatter it, you will see the difference between our silique and the pod of a pea.

"For whereas in the case of the latter, the seeds are fastened all the way down on one side of the pod, in our siliques they are placed by turns, one on one side and one on the other.

"And the reason for this different arrangement lies in this fact, that when the pea-pod opens to shed its seed it splits only on one side *from top to bottom*, whereas our siliques open in just the opposite way. It splits from the bottom upwards to the top. Each side of the seed-vessel curling up with its own share of seeds inside it, and only held together at the top by the stigma.

"About half of us cruciform plants have our seeds in this silique or long husk, the other half, amongst whom are the cresses, the horse-radish and the scurvy grass, have much shorter seed-vessels, which are called silicles or pouches, to mark the difference between the long and the short husks.

"But with few exceptions both kinds of husks are fashioned in the same way.

"And now," wound up Mr. Wall-flower, "I advise you to make a tour round your garden as well as through the lanes and meadows, and try and discover some other members of my large and widely-respected tribe.

"Remember to look for the calyx divided into four sepals, for the corolla divided into four petals, placed crosswise, and for the six stamens, four long ones and two short ones, and then you will not go far wrong in your search. And now, farewell little folk, and do your best to remember something of all I have told you."

"That we will," said Rhoda, and by way of keeping her promise, she set herself at once to study this page in Lady Science's book.

WALL-FLOWERS.

Class, dicotyledon; *tribe*, cruciform; *family*, cheiranthus.

Stem, branched, bearing blossoms arranged in a corymb.

Calyx, divided into four sepals.

Corolla, divided into four petals, each ending in a *claw*.

Stamens, placed on top of flower-stalk, six in number, four long and two short.

Pistil, solitary, with forked stigma.

Seed-vessel, silique or husk, opening from the bottom upwards.

CHAPTER III.

MISS DAISY.

"A gold and silver cup
Upon a pillow green,
Earth holds her daisy up
To catch the sunshine in.

Like lowly, white-crowned queen,
Demurely doth she bend,
And stand with quiet mien,
The little children's friend."

—*Sutton.*

"IT really is rather funny," said Rhoda to herself, "to be going to such a tiny governess that we shall actually have to lie down on the ground if we want to get at all within reach of her voice. I hope Hugh won't grumble about it."

As perhaps my readers can guess, Rhoda was thinking of that little flower with "silver crest and golden eye," from whom she was to have a lesson with Hugh that day.

"There's one thing," remarked Hugh, as they went along, "a daisy is such a poor little thing, there can't be much to learn about her or her tribe either."

Great was the children's surprise, therefore, when the small daisy began her lesson by saying, "I hope you have brought plenty of patience and attention with you, for there is so much for you to learn about my tribe that I have engaged the services of two assistants, who will instruct you on certain points upon which I cannot speak from my own experience. Master Dandelion yonder," and the Daisy nodded towards a spruce young dandelion; "and old Mr. Thistle on the side of that deep, dry ditch," and she pointed to a tall, noble-looking thistle, "will each kindly take their turn in teaching you, both being my relations you know."

"Your relations!" cried the children. It seemed impossible to believe that either that smart young dandelion or that tall, powerful prickly thistle could in any way be related to the pale, low-growing daisy.

"The truth is," went on the latter, "we three belong to what is called the tribe of the composite, or *compound flowers*, because each of our flowers, or what *you* call flowers, is in reality made up of ever so many smaller flowerets; and our large tribe includes so many different families that it has been found necessary to divide it again into three lesser tribes or groups, which, for the sake of distinction, are called *orders*. There are three of these lesser tribes:—

"*Number one* is known as the Chicory Order, and of this we will call the dandelion the prince.

"*Number two* is the Thistle Order, of which that gentleman to whom I introduced you just now calls himself the emperor.

"*Number three* is known as the Ray-bearing Order, and it is to this that I belong," added Miss Daisy; "in fact, I am sometimes called its queen. I suppose really you ought to have begun your lesson with Mr. Dandelion and ended it with me, but my friends said, 'ladies before gentlemen,' and so they would have me begin; and as I don't want to keep them waiting too long, I'll proceed at once to tell you my name. My class, by the way, is that of the dicotyledons. I, amongst the ray-bearers, am known as Miss Bellis, bellis being the Latin word for charming, and some folks tack another Latin word, perennis, on to my name, to show that I am everlasting. It is also useful to distinguish me from two sisters of mine—Miss Bellis Sylvaticus and Miss Bellis Annua, both of whom have come over here from distant lands to play the part of fine lady Double Daisies in your gardens."

"But surely," asked Rhoda, "that great ox-eyed Daisy is a brother of yours?"

"No, only a cousin, and our family name even is not

the same," said the Daisy. "He is a Mr. Chrysanthemum and belongs to the family of that name, about whom there is so much fuss made in your gardens. Ah, yes! you look surprised to find that I am so highly connected, but the Chrysanthemum is only one of many grand relations of mine, for to my own especial order belongs the gorgeous Dahlia, with her beautifully-quilted velvet petals, and that magnificent fellow the Sunflower, with his broad, golden face, who, because he feeds poultry, some folk have nick named him the Farmer Sunflower, whilst others say that he is only a Daisy grown larger, with gilded petals.

"So you see I'm not badly off in the way of grand connections.

"Well now, in the matter of roots, smart Master Dandelion will no doubt enjoy talking to you about *his* roots, but I shan't say much about mine; they are called perennial, which means lasting several years, and are perhaps chiefly remarkable for taking very firm hold of the ground and spreading themselves so rapidly over lawns and meadows that the cross-grained farmers and gardeners grumble at us for being unwelcome intruders. There was a time, however, when folks respected our roots so much as to believe them to be a charm against evil omens, and many people wore my root about them or

slept with it under their pillows. But that was long ago.

"My stalk is, as you see, round in shape, hairy, and bears one single flower. My leaves are what are called *inversely egg-shaped*, that is in the shape of an egg turned upside down, growing narrower at the base and their margin having rounded notches. I need scarcely remind you what the uses of my root, leaves, and stalk are to the rest of my plant, for surely you must know by this time that while the root and the leaves, each in their own way, procure and prepare the necessary food for the plant, the stem or stalk is the trusty attendant who carries the nourishment to my blossom. To-morrow I shall have a great deal more to tell you. Now we will only sum up a ltttle what you have learnt to-day. I am in the class of the Dicotyledons, and the tribe of the compound flowers to which I belong is so extensive that it is divided into three orders, the Chicory Order, the Thistle Order, and the Ray-bearers. To which of the three orders do I belong?"

"To the Ray-bearers," said Rhoda, "and your surname is Bellis."

"To which is added Perennis," went on the Daisy, "when folks want to distinguish me from my two garden sisters. So you see these few words, dicoty-

ledon, compound, ray-bearing, bellis and perennis, tell you pretty nearly my whole history. They tell you that my seed is in two lobes, that my flowers are composed of smaller flowerets, that my corolla is arranged in rays, and lastly, that I am both charming and everlasting."

Part II.

"Yesterday I made rather short work of my roots, etc.," said Miss Daisy, as she opened her lesson next morning, "because I wished to have to-day clear to talk of other things."

"But what sort of other things?" said Rhoda, "for I can't have anything to learn about stamens or pistils, I'm sure, for though you've got a calyx and a corolla like other flowers, you've no dust spikes, and not even a general servant standing up in your midst."

"So that's all you know about it," retorted the Daisy, "for whereas I have many more stamens and pistils than any other flower you have yet met with, my calyx is not at all what you fancy it to be. In fact, we compound flowers don't use the word calyx, but we call that green covering which you call a flower-cup,

our *involucre*, which means that it is an envelope to the flowers within it.

"Now, whereas the divisions of an ordinary calyx are called sepals, my green envelope is said to be composed of *bracts* or scales, for that is the name given to the little, long, narrow leaflets which overlap each other so neatly like the tiles of a house, that they are said to be imbricated.* Now, my involucre consists of two rows of equal, blunt scales. By-and-bye, when all my florets, the outer crown of silver ones, and the inner star of golden ones have disappeared, these tiny bracts or leaflets will still remain in a ring all round my cone-shaped seed-vessel, because, amongst us compound flowers the calyx tube is fastened on to the ovary or seed-vessel.

"Now we come to my corolla, and now is the time to remind you that we are called *compound* flowers because we really are a whole family of flowerets crowded together into the gold and silver star which counts with you as only one flower. There are so many of us that there is no room for each floret to have a separate stalk of its own, and so our stem is obliging

* "Imbricated," said Rhoda's little book, "is from a Latin word meaning a tile; imbricated therefore means *tiled* like the roof of a house."

enough to swell itself out at the top, so as to make a regular little platform where we flowerets can stand.

"Now, as you will see presently, we daisies are composed of two sorts of florets, which are not only unlike each other in colour, but differ from each other in shape. Those that stand in the middle of the platform, and are often spoken of as the eye of the daisy, are yellow and tubular, that is, rounded like a tube; whilst those flowerets that make such a pretty silver fringe to our golden centre are white in colour and strap-shaped. It is these silver florets which earn for our order the title of ray-bearers, and some old writers have compared them to the rays of light supposed to be shed from our little sun-like centre.

"And now you will be surprised to learn that each of these silver rays instead of forming only a part of the corolla, is a little corolla in itself, composed of but one petal, and having its own pistil and seed-vessel but no dust spikes. The white flowerets generally come into flower before their golden brethren; but all this," added Miss Daisy, "you can, if you like, see on a larger scale in my cousin, the big, bold-faced ox-eyed daisy."

"No, thank you," said both Rhoda and Hugh, "we would rather stay with you. Miss Daisy, do tell us

where those tiny yellow folk in the middle of your platform have hidden their pistil and stamens."

"They've not hidden them," said the Daisy, "they're plainly enough to be seen, if you know where to look for them. Now, if you were to take one of my centres and pick it to pieces carefully, you would see that each of my golden tube-shaped florets is what is called five-cleft, with its own stamens and pistil rising out of the midst. And it is the arrangement of these stamens and dust spikes which forms the most peculiar part of the floret.

"In other flowers, such as the buttercup and wall-flower, you saw the stamens standing round the pistil, each one with their little pouch of gold dust on their heads, and each distinct and separate from one another. The stigma, or top of the pistil, you likewise saw, was furnished with a moist surface, so that the gold dust might easily stick to it, and the pistil being shorter than the surrounding stamens, it was easy to understand how the pollen would naturally fall on the stigma below them, and then find its way into the pistil.

"But our stamens and pistil are quite differently arranged. In every golden floret there are five stamens; if you are careful in dissecting one of these

small yellow folk, you may see the four little threads of the dust spikes, and these, though separate from each other at starting, are all joined together at the top by their anthers or dust-pouches. And so they stand, hand in hand, as it were, round the pistil.

"The double stigma of the pistil rises just above the anthers, whilst the ovary, or seed-vessel, is just below them at the base of each floret. If you were to examine the arrangement of our stamens and pistil in one of my buds, you would see that at starting, the pistil was much shorter than the stamens. It is only by degrees that the double stigma can push his way through the ring of united anthers and stand up above them."

"Ah! but I guess something," cried Rhoda; "isn't it arranged like that to enable the stigma to collect its own flower dust for itself as it elbows its way through the little mob of anthers?"

"Well, that's not a bad guess," said Miss Daisy, "only unluckily it's wrong, because, you see, the part of the pistil which elbows the anthers is not the sticky part, which is made on purpose for the flower-dust to act upon. This sticky part is contained in the double stigma of the pistil, which as yet has not been able to open itself, because as long as it

was pressed on all sides by the anthers, it actually had not room to stretch itself. It is only when the pistil has forced his way through the anthers, and raised his head above them, that the double stigma can unfold itself and spread out its sticky surface."

"Ah! and then it must be too late," said Rhoda; "for by that time it has left the gold dust pouches behind and below it. But perhaps the duty of a pistil is not the same in a daisy as in other flowers; perhaps *your* pistil isn't obliged to coin the gold dust into seed, and store it away in the seed-vessel. But yet" went on Rhoda thoughtfully, "all your florets, the white as well as the yellow ones, have their own seed-vessel, and I can't see why their anthers should stand hand in hand just above the ovary, as if they were guarding it so carefully, if there is nothing in it."

"Ah! but there is something in it!" said Miss Daisy; "in each of these seed-vessels there is one cell, and in that one cell there is a single seed, so that it is quite clear you see that somehow or other, the pistil gets hold of the pollen; the only puzzle is, how does the pollen reach his stigma or top?"

"I can't guess," said Rhoda, "unless the pollen has wings of its own."

"No, the pollen hasn't wings, but something else has, and that's a bee," said Miss Daisy. "Now I will let you in to some of the secrets of Dame Nature's wonderful workings, and how everything in her kingdom has its own appointed uses. Now when a bee settles in the middle of one of ourselves," went on the Daisy, "he has not come as an idle morning caller to waste his own time and ours, for he has come to fetch what we call his own bee-money, the nectar or sweetness which he sucks out of our blossoms, and which he will presently convert into honey. And whilst he is hard at work collecting it, you will see that his legs push down first one golden floret and then another, till in a few minutes he has smothered himself with the yellow powder from the anthers. And as his velvet coat and polished legs have nothing sticky about them, the pollen does not cling to him, but is shaken off from him, and falls naturally on the stigma of our florets, in very much the same manner you know, as the mud falls from little folks' boots when they come indoors after a long walk, and forget to make use of the scraper.

"And so you see, thanks to this little winged thief, the flower dust reaches my stigma, and from my stigma, in due course is carried to the one little cell

inside the tiny seed-vessel at the base of each of my florets. And by-and-bye, when all we sister flowerets, gold and silver, are alike, withered and dead, you will find our fruit in what looks like a green sugar-loaf with a blunt point rising up on the top of my stalk. And this will have taken the place of the little platform you once saw there, crowded with its golden occupants and fringed with its silver rays. And in that cone are all my seeds, each occupying its own little cell, and as separate from each other as were my florets in the days of my youth and beauty.

"And as each floret passed away, leaving one seed behind it, so, in due time, each of these seeds will fall to the ground again, and bring forth fresh blossoms.

"And now," wound up Miss Daisy, "though there are still very many things which I should like to mention to you about us, of the ray-bearing order, I must bid you 'good-bye,' for I know that Master Dandelion is impatient to begin his lesson, and you must go on to him next, instead of coming back to me."

And so ended Miss Daisy's lecture.

Part III.

MASTER DANDELION.

"Dear common flower, that grow'st beside the way,
Fringing the dusty road with harmless gold."—*Lowell.*

"Good morning, my dears," said the Dandelion next morning. "I suppose you've heard all about the chief peculiarities of our tribe and the general description in fact, of us compound flowers, from Miss Daisy; indeed, to tell you the truth, I quite hoped that she would kindly explain all the most tedious part of the business to you, and so relieve me."

(Rhoda could not help smiling; Master Dandelion was so uncommonly like Hugh, who always took care to leave the most troublesome part of a joint task to be done by his sister).

"And so I daresay she explained to you," went on the young Dandy, "that although we belong to the same class, and the same tribe, our *order* is not the same. I belong to what is called the Chicory Order, and being, I may say, prince of this lesser tribe, I set the fashion as to the prevailing colour. Most of my order you will find wearing a yellow uniform, all the twenty-two different hawkweeds,

for instance, and the cat's ears, to say nothing of all the lettuce family.

"True, the wild salsify is purple, but chiefly I believe, in consequence of a terrible bruising he got from his brother, the yellow goat's-beard, and the sow-thistle is blue, and the chicory also."

"What does that funny name of chicory mean?" asked Rhoda.

"Something, my dear, that you must go to Arabia to find out," answered the Dandelion. "It was so called by the Arabs; but why, I'm sure I don't know, nor do I care; it's no concern of mine. But I can tell you about *my* name, Leontodon. That is composed of two Greek words, and means the tooth of a lion, because my leaves have such deep, sharply-toothed edges, just like the teeth in a lion's jaw."

"And have you any brothers or sisters of your own name?" asked Rhoda.

"None that I know of, so don't interrupt me any more," said Mr. Leontodon, rather crossly. "I do want to talk about myself and nobody else. Now to begin with my root. That is called simple, being in shape like a carrot. It is thicker than two of your little fingers put together, and is often as much as three inches in length, with tiny root-hairs springing

out from it. It is, moreover, covered over with a fine brown skin, which has a beautiful aromatic taste, as those folks know who have been wise enough to eat it. Then as regards my stem," went on Mr. Dandelion, "ah, well, I haven't got one."

"Not got a stem," cried the children, "but how funny."

"Not at all funny," retorted Master Dandelion, "heaps of flowers are like me in that respect. Look at the primrose and the snowdrop, to say nothing of Miss Daisy herself, who, I think might have taught you, what I see, I must teach you now. When, as in my case, the root sends its flower-stalk direct from the ground, the flower-stalk, bearing only one blossom and having neither leaf nor branch, is called a scape.* I suspect, my young friends, that you've made enough Dandelion chains to have discovered for yourselves that my pretty pinkish scape is hollow, and contains a curious white juice."

"Oh, yes, just like milk," said Rhoda.

"It's a good deal stronger than milk, I can ell you," said the Dandelion, "as you must have found

* "Scape," said Lady Science's booklet, "is from a Greek word meaning something on or with which another thing supports itself."

out if you ever stained your fingers with it. It is the especial food necessary for the growth of my beautiful golden fringe, and not only does it make *me* so handsome and strong, but you two-legged folks are not ashamed to rob me of my life-juice to strengthen your own weak bodies with.

"Now, turning from my scape, look at my beautiful leaves with their deeply-notched edges, springing up in a handsome tuft straight from the root, and spreading themselves round the base of my scape, as if they loved to lie at the feet of my beautiful flower, but would always remember that they must keep a respectful distance from my golden blossom. My leaves, by the way, are called *pinnatifid*, and being something of a scholar," went on Master Dandelion, "I happen to know that that word is composed from two Latin ones, meaning 'a feather,' and 'to cleave.'"

"Oh! I know," said Rhoda, "we learnt about that when we were hearing about the cuckoo flower."

"Noodle!" cried the Dandelion, "her leaf was *pinnate*, and no more means the same thing as pinnatifid than her leaf looks like the Dandelion's. For whereas the word pinnate, or feather-like, describes a leaf made up of a number of leaflets ranged along

the opposite side of a common stalk, pinnatifid, cloven like a feather or gabled, describes a leaf like my own which is so deeply cut on each side as to be gabled in fact. And now, young people, by the time you have answered these few questions I shall put to you, you will have had a long enough lesson to-day. And pray make haste with your answers, for I want to be at liberty to entertain my good friend Sir Bumble Bee, who will be here directly for his noon-day chat. Now, sharp, what does my name Leontodon mean?"

"The tooth of a lion," said Rhoda, "because the edges of your leaves are so toothed."

"Right, and my common name of Dandelion means the same thing, it doesn't mean a Dandy Lion, as some of you little geese think. And what is the name of my order?"

"The Chicory Order," said Hugh, "and you have a root that's called simple, and is like a carrot."

"And what have I got in the place of a stem?"

"Only a flower-stalk," said Rhoda, "which is called—called—"

"Scape," roared Master Dandelion, who was certainly not half so patient as the meek little daisy.

"Oh! yes, scape!" echoed Rhoda, humbly.

"And what are my leaves called? Come, make haste, do."

"Oh! ah! something that's cut like a feather, at least, yes, gabled," said Rhoda, who by this time was so frightened that her voice sounded quite shrill.

"Pinnatifid, you couple of geese," thundered Master Dandelion; "I should think you might remember that, for isn't that the name of the white thing you two-legged children wear on your stem?"

"Oh! you mean *pinafore*," cried Rhoda; "well, it's not quite the same, but it sounds so much like it that it will help us to remember that long word," and from that day forward both Rhoda and Hugh never forgot the right term for describing the shape of Dandelion leaves.

Part IV.

"I suppose," began Master Dandelion next day, "that Miss Daisy has explained to you that *our* involucre is not a simple calyx like that of most other flowers, but is really made up of a number of little

bracts or leaflets, each of which is a complete calyx in itself."

"Oh! yes," said Rhoda, "and I see the outer bracts of your involucre, Mr. Dandelion, turn backwards like the sepals of Miss Buttercup's calyx."

"Just so," was the answer, "about a dozen of the green leaflets turn backwards, whilst about as many more stand upright inside them. Now you have learnt that in our tribe many flowerets go to make up what *you* call only one flower, but do you know why we compound flowers are said to bear our blossoms in a head?"

And as Rhoda shook her own, Master Dandelion went on, "Well, then, listen. Suppose that each of our little florets had stalks of their own, you would then see them growing one above the other up to the top of my stalk in what is called a spike. Do you know what a spike is?"

"Yes," said Hugh, "it is a sharp sort of spear, useful to run a fellow through with."

"Perhaps that's the use you two-legged savages make of it," said the Dandelion scornfully. "We flowers wear our spikes for ornament, not use. The meadow orchis wears his blossoms in a spike, and so does the plantain, whose queer, dark brown flower

children call 'French and English,' and amuse themselves by striking one against the other till their stalks break.

"Now imagine such a spike pressed from above downwards, so as to bring the blossoms all to a level, the top blossom would occupy the centre and the lowest blossoms would stand round, just as you saw to be the case in the daisy, where the golden florets filled the inside and the white rays stood round the edge. And that is our case, our florets were naturally arranged to grow in a spike, but Dame Nature, for reasons, no doubt, of her own, saw fit to *squash* all our topmost flowerets down, as nearly as she could, to the same level as the lowest growing of their brethren, and this arrangement of blossoms is known as a *head*, and is a very useful guide to learned folk in recognising the members of our tribe.

"As regards my florets, as you can see, they are strap-shaped, yellow and irregular, not being all the same size or length. Unlike those of the daisy, my florets are called *perfect*, because each is furnished with five stamens and a pistil. Now, I am sure Miss Daisy must have told you how our morning callers, the brown bees, assist us in distributing our pollen amongst our various pistils, so I shall not say anything further about

that, as I want particularly to draw your attention to the arrangement of my involucre or calyx, a peculiarity which we share with the thistle and some others of my tribe.

"To begin with, whilst the lower part of my calyx is an involucre, the upper part is called 'pappus,' which means literally, old man. Now, I think the folk who first tacked on that word to my calyx must have meant old man's hair, because it is a white, woolly substance, like the grey hair of old age. Well, now, Miss Daisy taught you, did she not, that each floret has a seed-vessel at its base?"

"Oh! yes," said the children, "and Miss Daisy called it an ovary."

"Just so," said the Dandelion. "Well, from the seed-vessel the pappus of feathery down extends upwards, acting first as a protection, a sort of cotton-wool covering you know, to the little floret, and then later, when the seed is ripened, it turns into that feathery wing, so well-known to every child who has ever tried telling the time by one of our ripened heads."

"Oh! I know it well," said Hugh, "it's called 'the Schoolboy's Clock,' you know."

"And now, can you guess," went on the Dandelion, "why Dame Nature made such a special arrangement

for this part of our flower? Well, I will tell you. Consider, when the time came for our ripened seeds to burst from their ovary, and to fall upon the ground, what scores and scores of young plants would be dispersed from a head like mine, where such a number of blossoms had grown together in a crowd. All these baby dandelion plants falling together on one small spot, couldn't possibly find enough food for themselves, and most of them would die at the very onset in the struggle to gain a mere footing in the over-crowded space. So Dame Nature, foreseeing that such would be the case, made a special provision to help all these young ones to get out into the world."

"Something like the kind people, I suppose, who pay for the poor things who live in crowded alleys to go out in ships to beautiful foreign countries," said Rhoda.

"Who send out emigrants, you mean," said Hugh, who had just been reading about some at home, and was very anxious to emigrate too.

"Or rather," went on Master Dandelion, as if he were too grand to heed the children's remarks, "I might say that Dame Nature serves our young people as she serves the young birds, when the time has come for them to leave their parents' nest; for she provides them with wings wherewith to fly out into the world

and bids the wind give a fair start and a helping hand to these little wayfarers. For as soon as my fruit is ripe, a slender beak lengthens out from it which is crowned by the downy pappus. This latter acts both as a wing and as a parachute to the seed at its base, carrying it through the air and balancing it at the same time. Many a time, as you played in the meadows, or wandered through the lanes, you must have seen all these young dandelion folk, standing in a downy crowd together at the top of my scape, all ready equipped for their flight out into the world. For when the time has come for the breaking up of the old home, my beaked and pappus crowned seeds stand on my receptacle—which once acted as a platform for the florets, before they had exchanged their golden glory for silver down—awaiting a favourable wind, just as white-sailed ships await the breeze which shall carry them on their outward-bound course, and then, all at once, when the wished-for wind blows, off goes a whole flight of my downy-winged fruits. Then all that remains to the parent plant is the pale, leathery-looking receptacle, dotted all over with little dark specks, which must surely have been the wounds which the going away of each of their children must have left in their parents' hearts."

"It seems rather ungrateful behaviour to the poor receptacle," said Rhoda sadly, "after it has served so good-naturedly as a platform for all that little yellow host, for them to fly away in a body, and leave nothing but what looks like the mark of their foot-prints behind them."

"Hem!" answered Mr. Dandelion crossly. "I suppose it is the way of the world, my dear, at any rate, it's the way of the Dandelions, so you need not trouble yourself to find fault with them," and with this closing remark, Mr. Dandelion shook his golden head so fiercely that both Rhoda and Hugh felt quite glad that their lesson was over, and instead of troubling him to repeat any part of his instructions, they contented themselves by reading over these few notes which they found about him in Rhoda's little roll:—

DANDELION.

Class, Dicotyledon; *tribe*, compound; *order*, chicory; *family name*, Leontodon; *root*, simple, carrot-shaped.

Stem, called here a scape, bearing but one flower.

* *Calyx, or involuere*, composed of various small leaflets called bracts, joined to seed-vessel, crowned with a pappus of white hair.

* *Leaves*, pinnatifid, or deeply notched.

Petals, irregular, strap-shaped.

Stamens, five, united by anthers growing on corolla.

Carpels, five, joined to calyx, containing one cell only, and one seed suspended.

Part V.

MR. THISTLE.

"The thistle washed himself in the morning dew,
And opening his pedlar's pack, out-thrust
A spruce little pair of leaflets new;
And made for himself a fine white ruff,
About his neck to wear;
And pruned and polished his prickles tough,
And put on a holiday air."

Lord Lytton.

If the truth must be told, it was with very reluctant feet that Rhoda and Hugh started out to take their lesson from the tall purple thistle, who was to be their third and last lecturer from the tribe of the compound flowers.

"He does look so dreadfully spiteful with all his prickles," said Rhoda; "I'm half afraid of him."

"Oh! *I*'m not afraid of him," said Hugh, "because I'm not a girl, but I *shall* stand a good way off from

him, because, you see, nothing but a donkey ever goes quite close to a thistle."

And Rhoda's fears and Hugh's intentions were written so plainly on their faces that their new teacher, reading them there for himself, began his lesson, by saying, "Ah! you noodles, I see you are afraid of me, as if it were not rather for us poor thistles to be afraid of the cruel folks who cut off our heads and kick us out of house and home, till they force us into being nothing better than wayside vagabonds. We don't want to offend them with our sharp leaves and prickly stems, I'm sure we're glad enough to leave them to themselves, if only they'd let us alone; but, of course, we use our natural weapons in defence of ourselves. If, as people say, we are fierce and spiteful, it is only ill-usage that has made us so."

"But still, though humans are unkind to you," said Hugh, "you manage to get along somehow, don't you?"

"Get along, I should think so, thanks to the blue blood in our veins, which makes us brave and always will make us a powerful clan," retorted the Thistle, who in his anxiety to boast, quite forgot that a minute before he had been representing himself as such an ill-used outcast. "We are indeed a very powerful clan,

and most highly connected. Our family name is Carduus—the Latins called us so long ago—but my proper name is *Onopordum Acanthum*, commonly called cotton thistle, and also widely known as the Scotch thistle. I, myself, come very near royalty indeed, being worn as a monarch's badge, and being so closely identified with the reigning Sovereign that I am actually represented on all the coins and seals of the realm along with the Sovereign herself. But to return to what I was saying about our large family. I have no less than eighteen brothers, all bearing our surname of Carduus."

"What does Carduus mean?" asked Rhoda.

"It comes from a Latin word meaning a point, and is a very suitable name for us, seeing we have plenty of points about us, and pretty sharp ones too. And though, perhaps, that garden nobleman, who bears the style and title of artichoke, and who makes himself so handsome in his old age with his crown of exquisite blue petals and pale lilac styles, would deny the relationship, he really is a half-brother of ours, and almost a thistle himself. Then besides the Carduus tribe—all of whom are so easy to recognise as my relations, that I shan't introduce them to you now,—I have several cousins.

"Amongst them is the pretty blue succory, who looks something like a large daisy with her strap-shaped florets, just as the yellow saw-wort looks as if he ought to belong to the dandelion order. Then, too, there is that spoilt child of some of the poets, the blue cornflower, with a host of pet names of her own, and the star-thistle, whom you are not likely to meet with often, being an exceedingly particular gentleman in the choice of his residence."

"Then I don't see why you should puzzle us by talking of him," said Hugh, rather disrespectfully, and rather meanly taking care to stand out of the Thistle's prickly leaves.

"Eh? what did you say, sir?" asked Mr. Thistle, and Hugh was already beginning to quake, when Rhoda diverted the old gentleman's attention by asking what that long name was, which he said a few minutes back was his own especial one.

"Onopordum Acanthum, my dear, was what the Greeks saw fit to call me," was the reply, "because my leaves were supposed to be like those of the acanthus, which was a thorny shrub and a native of Egypt."

"But what is the meaning of your first long name?" persisted Rhoda.

"Never you mind," answered the Thistle, in that

sour tone which folks sometimes use, when they are asked a question which they don't know how to answer. For this was indeed his case. He had never rightly understood the meaning of his long, grand name, but as he had a shrewd idea that the first two syllables, at any rate, must have something to do with the Greek word for an *ass*, he had never risked any enquiries on the subject.* And so, probably by way of avoiding any more discussion on the matter, Mr. Thistle directed his pupils to address him for the future by his English name of "Cotton Thistle."

(I suppose, my readers, we must forgive him for leaving out the "common," which always forms part of his name in the books that tell his history.)

"And," went on the Thistle, "I'm not going to bother you about the names of my class or my tribe," and seeing the children's pleased looks, he added, "I suspect you are growing rather tired of us compound flowers."

"Oh! horribly, dreadfully tired!" cried both children, whilst Hugh added, "So if you please, let's begin with your stem, if you've nothing very wonderful to tell us about your root."

* "Ono pordum," said Lady Science's book, "is clearly derived from the two Greek words, ὄνος an ass, and φορβή fodder, thus meaning ass' fodder."

"Very well," answered the Thistle, "I'll give in to you there. Well, my stem, as you can see, is studded with sharp points, which are called *spines*. These are different from the prickles of roses and brambles, which are really little hooks to help the plant to climb with. Then it is further remarkable as being what is called a winged stem, because the way in which my leaves grow is also remarkable. Now examine them for a moment. They are oblong in shape, with toothed, spiny edges, and downy on both sides, and besides this, they are what is called *decurrent*, which means to say, running down the stem. You have not met with this peculiarity before in other tribes, but now you will find that it is a very common feature amongst the thistle family. Our stem generally grows from four to six feet high, and we take care, not only to arm our leaf with its own sharp spikes, but also every joint of our stem is guarded with its own special daggers.

"And now, really," wound up Mr. Thistle, with a sudden change in his voice, "I can't waste more of my morning in teaching you two-legged dunces, for I have a whole party of dumbledores coming to take their luncheon on my blossom, but the next time you come my way you shall hear the end of my story."

Part VI.

"Who remembers where we left off in our lesson?" asked Mr. Thistle, a few days later. Hugh never remembered anything without Rhoda to help him, so she it was who answered, "You were telling us about the spikes on your stem and on your leaves, Mr. Cotton Thistle."

"To be sure, to be sure," he said, nodding his purple crowned head. "Well, not only have we thorny stems and leaves, but our very flower-cup is thorny too. Our calyx or involucre, as we compound flowers call that green part of ourselves which encloses our blossom, like that of the dandelion, consists of two parts. The lower part of mine is described as *globose* or round, and is composed of firm, solid scales, like little tiles overlapping each other. They are awl-shaped and spread in all directions, each ending in a sharp dagger. The superior or upper part of the calyx is composed of a tuft of fine hairs, called, as you learnt from Mr. Dandelion, a *pappus*, but my pappus differs from his in having no stalks but in coming immediately on the top of the ovary, or seed-vessel.

"Of course you remember that amongst us compound flowers the calyx is always joined to the ovary. Some folk have compared the arrangement of my ovary, calyx,

and pappus to that of a shuttlecock, and it's not a bad comparison. The ovary does for the cock, the green covering for the velvet, and the pappus for the feathers.

"Now, if you could screw up your courage, which I'm sure I hope you won't, to attack one of my blossoms and pull it to pieces, you would see it was made up of ever so many tiny purple florets, each perfect in itself, that is, having five stamens and a pistil.

"About the curious arrangement of our anthers you have learnt from Miss Daisy and Master Dandelion, and also you have heard how useful the bee is in distributing our flower dust, so I shall not talk about that now, but go on to speak of my seed.

"By-and-bye you will see all my purple florets fading, each leaving in its place a tiny, white silky plume, like the little pale ghost of its own former self, till instead of my imperial purple-crowned head, you will see nothing but a soft, silky white puff-ball. Then you will be told that my flower has run to seed, which means to say that the time has come for our seeds to leave the parent plant and to soar away in search of a new home, each on its own little white wing, which for all that it looks so slight is firmly fastened to the seed at its base.

"The gold-finches," continued Mr. Thistle, "are

terrible enemies to us, for they gobble up our seeds as greedily as some small folk gobble up blackberries, yet for all that, in spite of the men who behead us and trample us under foot, and of the asses who munch our leaves and blossoms and the goldfinches who devour our seeds, we still continue to flourish.

"And now come, confess little people, though I may look thorny and fierce, I have not been such a cross old tutor after all. And now, in conclusion, I will only remind you of a few facts:—*Firstly*, that I, Mr. Cotton Thistle, otherwise known as Scotch Thistle, have spines on my stem and not prickles, as I don't want any hooks to help me to climb. *Secondly*, that my stem is called winged, because my leaves run down it, and are therefore called decurrent leaves; and, *thirdly*, that my florets are called perfect because each has its own seed-pod, pistil, and stamens.

"And now you may go on your way, and I think, if you have any gratitude in your nature, you'll say a good word for the future for the poor wayside, vagabond Thistle."

Extract from Lady Science's Book.

Class, Dicotyledon; *tribe*, compound; *order*, thistle; *family name*, Onopordum Acanthum; *stem*, winged,

studded with spines, *not* prickles; *leaves*, decurrent, that is, running down the stem, armed with sharp spines; *calyx*, in two parts, involucre, composed of small imbricated tracts, upper part pappus; *florets*, perfect, having five stamens, pistil, and ovary.

CHAPTER IV.

MR. FOXGLOVE.

"Bring the Foxglove Spire."—*Tennyson.*

OF all the flowers that she had ever seen, in meadow or coppice, or hillside or hedge-way, there was none that Rhoda admired more than the Foxglove. She thought him the perfection of stateliness and beauty, rearing his downy stem on the top of a steep bank, and hanging out his peal of rich purple, reddish bells in such symmetrical order, tapering up from the large, deep-throated blossoms at the base of his stalk to the tiny, tightly-closed buds, which, as she used to say, finished off the pyramid of blossoms just like the small silver bells on baby's coral rattle.

"Oh, I am glad the time has come for the Foxglove's lesson," Rhoda said to Hugh, as they climbed up a bright sunny bank one June morning to a spot where

a clump of Foxgloves grew, looking so gracious and condescending that they seemed almost to beckon the eager little climbers to their side.

"Oh, you dear, dear beautiful creatures," cried Rhoda, reaching them at last and settling herself down so close to them that she could put her arm round one of their downy stems and let their drooping bells tickle her cheek. "Is there anything in the garden half so grand or beautiful as you?" and with careful fingers she raised one of the blossoms and looked into the heart of the bell, where the deep crimson spots showed darkly amidst the silky white hairs.

"Oh, I hope you will give us a nice long lesson," she went on, "for I shall never be tired of hearing about you and all your brothers and sisters."

"Ah," said Mr. Foxglove, speaking for the first time, "my brothers and sisters are very different from me, I can tell you. I suspect you'll open your eyes a bit when I tell you who some of my relations are, for, first of all, you see we figwort tribe are a very enormous one. We contain nearly two thousand families, of which, to be sure, some are shrubs, and we inhabit all parts of the world, from the cold north pole, where the little bears come and dance round and amongst us, to the burning tropics, where it is so hot that even the

chance touch of a humming bird's wing seems to oppress our limbs. Then, also, there is so little family likeness amongst some of our members that unless you had been already introduced to many of us as belonging to the figwort tribe you would never find it out for yourself. You would never imagine, for instance, that either the blue-eyed speedwell or the eyebright, with its tiny white blossom and lilac-marked petals, belonged to my tribe, or the ivy-leaved toadflax, poor weak creature, with its trailing stem and branches. And yet we are all alike brethren of the figwort tribe. The Scrophularia tribe we are sometimes called, which is a Latin name for a certain disease which the figwort was supposed to cure; but it is such a very ugly sounding word that I never care to revive it, and you need only remember that I wish my tribe to be spoken of as that of the *Figworts*.

"To be sure I've never yet discovered why such a large and important tribe as ourselves should be condemned to bear the name of such a dingy, unfortunate-looking plant as is the figwort, and I daresay Dame Nature laughs heartily over the blunder some of your clever folks have made in that matter. Still, since we are doomed to call ourselves after this rather peculiar

member of our tribe I will just mention a few of her oddities.

"The knotted figwort, as she is called, to distinguish her from four of her sisters, is a tall and slender plant, three to four feet high, with a very square-shaped hollow stem, and her blossoms are such that really my own glorious bells are almost ashamed to own kinship with them. They are a dull purple, or perhaps you would say a dingy red mixed with a greenish yellow, and always look as if they had been nibbled by some insect," and the Foxglove's bells seemed to shudder with one accord at the account.

"I suppose she can't help her looks," Rhoda ventured to remark.

"No, and I would forgive her for them," said the Foxglove, "if she wasn't the head of our tribe; but, oh! to think of *her* in such a position," and something like a groan seemed to shake his comfortable, firm stem and set all his blossoms quivering.

"But I'll tell you what did it," he went on, in a low, solemn voice; "it was her *roots*, and as I shan't have anything particular to say about my own I'll just tell you about hers. They consist of a lot of white knobs, generally round, and strung together by fibres, little tough threads you know. The knobs vary from the

size of a pea to that of a large marble. Now these knobs are so like certain swellings produced by the disease for which the figwort was supposed to be a remedy, that some of the wise folk who undertook to stand sponsors for our tribe and choose its name, saw fit to label us all with that hideous one, though considering that they employed twelve letters to compose it, I think they might have made a better job of it. There now, we have talked enough about the figwort, and it is high time I should talk about myself.

"Now, I don't suppose there's a flower in the world who has such a number of names as myself, not in this country only, but wherever I am known in the world. The French call me "Our Lady's Glove," the German's "Our Lady's Thimble;" but without wandering abroad, nothing can be really prettier than the names which are given me close at home. The Irish call me "Fairy Cap," the Welsh "Fairy Glove," and my own old English name means the same thing, "Folks' Glove," that is, the "Good People's Glove," for I never had anything to do with *foxes* any more than I had to do with dead men, and so why those Scotch people, those fellow-countrymen of Mr. Thistle's, call my beautiful blossoms by the gruesome name of "Dead Men's Bells" I have never yet found out, for

they had no need to stray away from the idea suggested by my own family name, given us long ago by the Latins, "Digitalis," which means something belonging to a finger, and which they might therefore have turned into a thimble or glove, as they liked best."

"I see," said Rhoda. "Then foxglove, after all, is only a kind of pet name; but still, if you don't mind, I would rather call you Mr. Foxglove than Mr. Digitalis, which is such a long word to say."

"Call me whatever you like, my dear," was the gracious answer; "and now try and tell me, as shortly as you can, all you have learnt about me to-day."

"Why," said Rhoda, "we have learnt not from you, Mr. Foxglove, but from looking at your leaves, that you belong to the class of the Dicotyledons; then, as you have told us yourself, your tribe is the figwort tribe;" and Rhoda felt almost as if she ought to beg her teacher's pardon for reminding him of this disagreeable fact; "and your family name is Digitalis, which means something belonging to a finger. And now please, Mr. Foxglove, we must run home as fast as we can, for there is a big black cloud eating up all the blue in the sky, and nurse said this morning that we should have a thunder-storm before sunset."

Part II.

Rhoda's nurse proved a true prophet. As soon as the big black cloud had finished his supper of blue sky, such a thunder-storm burst over the earth, that Rhoda, lying snugly in her little bed, thought anxiously of her poor foxglove out of doors on the bank, whose lovely bells and soft downy leaves must surely be getting most terribly drenched.

"Oh! dear, I'm so glad to find that you're still alive," she panted, as she clambered up next morning to the spot where the clump of foxgloves grew safe and unharmed, looking only a little fresher and brighter for their sharp shower-bath overnight. "I thought so much about you in the thunder, didn't we, Hugh?"

"I'm sure I'm very much obliged to you both," said Mr. Foxglove, "but now we won't talk any more about what *you* did or thought, I want to talk about myself."

"How funny it is," whispered Rhoda to Hugh, "that even the very flowers always want to talk about themselves."

"Well, now," went on Mr. Foxglove, "you must listen to what I have to say about my stem. Each of my plants has one principal stem with shorter ones branching out from it. It's not square like the figwort, you see, or hollow like hers, but it is nearly round

where it springs from the root, though it grows more inclined to be flat as it twists itself up towards the top. We are said to bear our flowers in what is called a *raceme*, that is a spike which is composed of many blossoms, each blossom borne on a short stalk of its own. In this respect you may see a family likeness between me and the little speedwell, whose blossoms are also arranged in a raceme. But I don't bear merely flowers on my stems. Each of my bells has its own attendant bract or leaflet, and this brings me to the subject of my leaves.

"These, you see, grow in quantities near the root on long stalks. They are very handsome, their colour a soft, rather dull green above, with a greyish green downy lining inside. Their margin is coarsely notched, while their network of veins stand out so clearly as to give the upper surface of the leaf a crumpled look. Some of my larger leaves are half a foot long, and these handsome young giants are useful as well as ornamental, for if properly prepared, they will cure sore throats.

"As you mount higher up my stem, however, my leaves, you will find, grow gradually smaller, till by the time we reach the place where my bells begin to appear, they have turned themselves into quite small

stalkless leaflets, which wise folk would describe as sessile, or sitting on the stem.

"It is quite right and proper, you know, that such should be the case, for I choose that my leaves should wait upon my blossoms, and, therefore, like well-trained servants, they understand how to shrink into the background and make themselves small in their master's immediate presence."

"Or rather," suggested Rhoda, who had been examining the top of the flower-stem, where she could see the tiny foxglove buds sitting each one in a kind of lap, as it were, between the leaflet and the stem; "aren't your bracts more like old nurses who take care of the babies as long as they can't look after themselves, and then have to see their nurslings growing up, till one day they discover that they are wanted no longer, and that the once tiny baby has grown into a grander, bigger person than themselves?"

"Well, yes, you may call them their nurses if you like, but as you have observed the little kind of lap in which the flower-bud sits, you must know that that is properly called an axil.* And now," continued

* "*Axil* is the name given to that kind of little hollow which occurs where the leaf leaves the stem, and a blossom springing from this hollow angle is called an *axillary blossom*," said Rhoda's book.

Mr. Foxglove, "we come to my calyx or flower-cup."

"Which I do hope," said Hugh, "is a proper one, and not one of those tiresome green envelopes like Miss Daisy and her tribe."

"Oh! yes, it is a proper one, I promise you," was the answer, "if you mean by that a real flower-cup. It grows on my receptacle, that is, you know, that part of the flower-bearing stem, where the blossom begins, and it is called persistent or not falling off, because it does not fall off with my petals, but remains attached to the top of my stalks. It is composed of five sepals or divisions, all separate from each other, though they are joined together just at the bottom.

"The arrangement of my sepals altogether is rather a curious one. The uppermost one of them is very small, the two next, one of each is placed on either side of the highest one, are larger, whilst the two sepals at the bottom are largest of all. When we look at the equally curious arrangement of my petals, you will see that the sepals have been specially fashioned to suit the former. Look at any irregular bell-shaped corolla, and you will see that it is what is called a united corolla, that is, that it is all in one piece. The divisions of such a corolla are not usually called petals, but

lobes, and, therefore, I say, I have five lobes, not five petals."

"I don't really see," said Hugh, "why you need make that difference, it's very puzzling."

"H'm!" said Mr. Foxlove, and he hesitated for a moment, never having given the subject much thought till now. "Ah! well, my dear, I suppose that since petal means something open or spread out, it is a more suitable term for the divisions of such a flower as the buttercup's or wall-flower's. Whereas *lobe*, which perhaps you may know was the word which the Greeks gave to the lower part of your ear, seems exactly suited to my queer rounded divisions.

"Now some of my blossoms are not so particular as they should be, to keep their lobes in the order in which Dame Nature first intended they should be kept, and this leads some folk to fancy that our corolla has only four lobes, but, remember, this is not so.

"I have two lobes at the top of my flower opposite to the small sepal, two lobes on each side, and one very large bottom one which comes between the two largest sepals, and the inside of which is so prettily marked with deep purple spots, showing darkly on the downy surface of silken hairs.

"To-morrow I shall invite you to peep inside one of

my beautiful bells, and learn about all the treasures which they guard so carefully within their spotted throats."

Part III.

"Come, come little people, what's the matter?" cried Mr. Foxglove, next morning, looking after Rhoda and Hugh who were turning their backs upon him, and running away down the bank as fast as their legs could carry them. They had only arrived a minute before to take their lesson, and Rhoda had just been lifting one of the Foxglove's bells to peep at its inside when a big bee had come tumbling out backwards. His velvet coat was all covered with golden flower dust, and he was thinking a great deal more of the treasure he had just acquired than of the small girl into the palm of whose hand he had landed himself.

"Oh! you nasty, horrid thing, you want to sting me!" cried Rhoda, knocking him off and running away so fast that she never observed that her winged foe had picked himself up again, and was by this time deep in another bell on a neighbouring foxglove, guiltless of harbouring any wish to do her grievous bodily harm.

It was only when she had got a safe distance from her imaginary enemy, that Rhoda paused, and, after looking all over her frock, inside her sleeves, and outside her hat, and finally shaking out her curls, decided that the danger was over, and called to Hugh, who, during her inspection had kept a good arm's length from her, to climb the bank again.

"Oh! you silly great two-legged thing," cried Mr. Foxglove, "you don't mean to say that it was the sight of my good hard-working little carrier that put you into such a fright? Dear me! what a joke it seems, that such a big thing as you should be so dreadfully afraid of such a small one that is not larger than the tip of one of your ten fingers. Now come along and sit down again, do."

The children obeyed, but as they did so they looked suspiciously into the other bells, and Rhoda remarked that she hoped there were no more bees tumbling about.

"You see," she said, trying like other little girls to cover up her folly by a half false excuse, "I shouldn't be afraid if the bee would come out head foremost, so that he could see where he was going, but tumbling out backwards like that, without meaning to sting us, he may fall on us, for want of seeing where he should go. Perhaps, Mr. Foxglove, you might just

ask the bees in your bells to be good enough to come out with their heads towards us."

"Stuff and nonsense," said Mr. Foxglove, "they *must* come out backwards, first of all because there isn't room in my bell for them to turn themselves round, and secondly, if there were, they know their manners better, being only our workmen, than to leave our presence in any other way than by going backwards."

"Oh! I see," said Rhoda, "as ladies have to do when they leave the Queen's presence. How funny!"

"Not funny at all," was the sharp answer. "It is only right and proper, all things considered, which said things I will begin to explain to you at once. There now, look into this bell of mine and you will see four stamens in two pairs, one pair long, the other short. They are joined to my corolla for about half their length, and look as if they were quite too weak to stand upright without this support, for where they leave my corolla they bend forward, the short ones slightly, the long ones very much, so that the anthers or pollen pouches of each pair meet and form two arches one above the other. Look what a bright delicate yellow my anthers are, spotted with dark

brown, and how prettily they contrast with my deep purple pistil which rises above them.

"And now you can see very clearly the three parts of which my pistil is composed.

"The large round germ, or seed-vessel at its base, the slender, elegant thread-like column which is called its style, and the double stigma or point which crowns it at the top.

"Well, of course you know that the use of the round germ at its base is to hold the seed or ripened fruit of our blossom, and that the style is the high road upon which the flower-dust must travel to reach that seed-house, and that the stigma is the sort of trap which catches the flower-dust in the first instance, and then sends it on its way down the style.

"But now, how does the flower-dust that is contained in those arched pairs of anthers ever find its way to the top of the stigma? Can you tell me that?" and Mr. Foxglove's tone was that of a person who is quite sure he is asking a riddle too hard to be guessed.

But Rhoda laughed, for she thought that this time she knew as much as her teacher.

"Why, you get one of those troublesome bees," she said, "to come in and carry the flower-dust from the anthers to the top of the stigma."

"Ah! you think yourself very clever," retorted Mr. Foxglove, "but though you're not quite wrong, you are not quite right either. If you weren't such little cowards, I would invite you to look into one of my bells and watch a bee at work there. Then you would see, that though in diving into my throat to feast on the honey I keep there, the bee probably knocks his little head against the wide-opened stigma in bending down to suck the honey, and certainly rubs himself against the anthers, so as to smother his coat with the yellow dust, he likewise backs out of my bell again without depositing any of the powder on the top of my stigma. And there is a reason for this, which is simply, that whilst the bee has been feasting upon my honey down below, the stigma up above has been gradually closing itself, so that by the time his meal is over, and he backs himself out of my bell, there is no sticky surface within his reach where he can deposit the flower dust."

"Then," asked Hugh, "why did you say just now that that blundering old bee was a good, hard-working carrier. It seems to me he's a greedy thief who sucks your honey and then flies away with all your flower dust, and leaves your poor stigma without it."

"Wait a bit," said the Foxglove; "I haven't finished my story yet. As soon as he leaves one bell he flies into the next, and now you will understand why I call him a carrier.

"Again, on entering the bell, the first thing our bee does is to knock his head against the stigma, and this being open with its sticky surface uppermost, receives all the pollen which falls from the dusty visitor's velvet coat, and head and trunk, whilst he is brushing by to reach the honey store below. The stigma then gradually closes itself up again, and when the bee goes away, smothered once more with the pollen which he has taken from the anthers, belonging properly to the stigma, the stigma doesn't grudge him his golden booty, for it knows it is already well supplied with the pollen of its neighbour blossom. So you see, the bee really acts as a carrier, carrying the valuable flower dust from the anthers of one bell to the stigma of the other."

"Oh! now we do understand," said the children, "and we shan't be afraid the next time we see a bee in one of your bells; we shall understand that he is really there on duty and not lurking there like some highwayman to spring out and attack passers by."

"And now," said Mr. Foxglove, "I suspect you

can almost guess the end of my story. My stigma will hand over the gold dust to my style, and the style will carry it to the seed-vessel, and the seed-vessel will swell and swell until it grows into what is called a *capsule*, or little chest. This is the name given to my seed-vessel, because it is in fact a little chest made up of two carpels or seed cases joined together, and holding a great number of seeds. And when my plant reaches this stage, you will see also why my calyx is called *persistent*, for though my handsome corolla will have passed away, you will still find my flower-cup doing the part of a faithful and attached attendant to the enlarged pistil with its long elegant style, with the same persistency as when it waited on my blossom in the heyday of its youth and beauty.

"And now," continued the Foxglove, "there is not much left to tell you beyond what you can easily guess. As soon as my fruit is ripe, the thin skin which covers my capsule will give way, and the seeds will be free to go out into the world and make a home for themselves, as the parent Foxglove plant has done before them. I daresay if you come here next year you will find ever so many fresh blossoms springing up, but if you have a good memory for old

friends, you will find me here again, for my root is perennial, which you know, means lasting several years."

"Oh! we are glad of that," said the children, "then, thank you very much for all you have taught us, Mr. Foxglove, and we won't say a real 'good-bye' to you. It is only a good-bye till next year."

Mr. Foxglove (extract from Lady Science's book).

Class, Dicotyledon; *tribe*, Scrophularia, or Figwort; *family name*, Digitalis.

Stem, erect, branched, downy.

Leaves, coarsely notched and wrinkled.

Calyx, in five sepals, joined just at the bottom, growing on receptacle, unequal in size.

Corolla, in five lobes, joined almost to the top, growing on receptacle, unequal in size.

Stamens, four, separate from each other, joined to corolla, one long and one short pair.

Carpels, two joined, stigma double, style very long.

Blossoms, borne in the form of a *raceme*.

CHAPTER V.

MISS DOG-ROSE.

"And blushing, the uncultured Rose,
Hangs high her beauteous blossoms there."
—*C. Smith.*

"HEIGH HO! little maid, so you've come to hear tidings of your namesake."

These were the words which greeted Rhoda one bright June day, when she and Hugh paused beside a lovely hedge, where whole sprays of Dog-roses were wreathed about in perfect "garlands of delight." The voice, which sounded pure and mirthful as a child's, evidently came from the golden centre of one of those delicately-tinted blossoms, and looking up, Rhoda saw one long spray, all set with its pink and white flowers, and elegantly cut leaves, and little rosy thorns, bending just above her head.

"Well, am I not a namesake of yours?" said the voice again.

"But I'm called Rhoda, not Rosa," was the puzzled answer.

Then there came a laugh from the depth of the fragrant blossom, like the tinkle of tiny silver bells. "Ah! if *you* had lived in the land of my ancestors," said the voice, "in the land where our blossoms mingled with the laurel and the myrtle, and shared in every pageant and festival, where stalwart warriors were not ashamed to wreathe us round their battle-stained locks, you would have known that roses were called Rhodas there. For Rhodon is the Greek name for a single rose, Rhoda for several, and they called us so from another word of theirs, which means red or blushing, because of the delicate colour of our petals. Then the Latins, who often played odd tricks with their neighbour's words, left out the h—half of which only was there in the beginning—*and changed the *d* into an *s*, so Rhoda grew into Rosa, and finished its days in this country as Rose. So as you see now, that you really are a namesake of ours, you must pay great attention to our history and that of our tribe."

"Will there be very much to learn about you?" inquired Hugh, who was rather cross that Rhoda should have more to do with the new teacher than himself.

* ῥόδον—probably allied to ἐρυθραίνω, to blush.

"Well," answered the Dog-rose, "if you only heard ever so little about all the members of my tribe, there would be an immense deal for you to hear, for not only are we a very large tribe, but we are a very important one. For to us belong all your favourite garden fruits, raspberries and strawberries, apples and pears, cherries and peaches, nectarines and plums, apricots and greengages, quinces and almonds. And besides these, our tribe holds many well-known ever-green shrubs, notably all the laurels, whilst outside the garden, we have besides, wild strawberries and cherries, the purple sloes and the blackberries. Then besides all the family of thorns, the blackthorn, the hawthorn, etc., our tribe numbers many lovely meadow flowers, such as the potentilla, with its cut silky foliage and showy yellow flowers, and that queen of the meadow, the elegant meadow-sweet, with its tall, creamy blossoms, the March cinque-foil with its handsome though rather dingy purple flowers, the agrimony, with its long tapering spires of yellow blossoms, and the burnet, with its oblong heads of deep purple brown flowers. In fact, the members of our tribe are so many, and vary so much from each other, that wise folk agreed to divide us into groups or lesser tribes, inside our one great tribe, for their greater convenience

in studying our different appearances and habits. And so we are cut up into six lesser tribes or orders, and each order is named after the chief of its members. But above them all, *I* still remain queen of the whole tribe which bears my name.

"*The first* group has the almond for its prince, and he reigns over the peaches and nectarines, and apricots and plums, besides all the laurels and many of our evergreens.

"*The second* group is called the meadow-sweet group, and here the queen of the meadow bears sway and reckons many ornamental shrubby plants amongst her subjects.

"*The third* group, my dears, you will think very interesting, though it does bear the rather long name of the potentillidæ, which means the strawberry group. For if you went on a visit to this lesser tribe, you would find besides king strawberry himself, his brother princes of the blood, the raspberry, the blackberry, and the dewberry, and if you cared to extend your acquaintance to those other members of the family, who are not eatable, you might call on the pretty cinque-foil family and the agrimony.

"*The fourth* group you might pass by without ever discovering that it belonged to my tribe, for at first

sight there is scarcely any family likeness between us and its members. Here the lilac burnet is acknowledged lord, and gives his name to the group, which is after all a very small one, including only his brother, the salad burnet, and the lady's mantle.

"And now," continued the Dog-rose, and as she spoke, a little thrill seemed to go through the whole of her lightly waving spray; "now we come to the fifth group, my group and your group, sister Rhoda, whose beauty and fragrance stand unrivalled in the whole world of flowers.

"First of all, there are all my exquisite garden relations, with some of whom you can seek an acquaintance at your leisure. And if you begin with the steady-going, homely old cabbage-rose, which, surely, even in these days of change, you will still find growing in the borders of some old-fashioned kitchen-garden, and end with the little pale, golden banksia rose, who loves climbing so well, that not content with clambering to the top of cottage walls, you may see her still stretching higher to reach the very chimneys, you will find that June, though it is called the month of roses, will hardly hold days enough for all your visits.

"I doubt if any flower can boast of more varieties

than the rose. Even amongst us wild ones, wise folk can't agree if we number, nineteen, twenty, or twenty-two different families. But you needn't look frightened, little people, I'm not going to give you the history of these, no, nor of one quarter of them; but we'll talk about that to-morrow, for I must leave my own special group now and go on to

"*The sixth* group. And now," went on the Dog-rose, nodding at Hugh, "if Rhoda took possession of my group, you wouldn't mind claiming the sixth, I am sure, for the rosy red apple is king of his company, and a goodly company it is, including all the varieties of himself from the noble golden pippin down to the pretty little wild crab, all the pears and the quinces, and the medlars and the service berries, besides the crimson fruit of the mountain-ash, and all the hawthorn family.

"So here we are at the end of my first lesson, and I think you'll agree with me now, that my tribe *is* an extensive one. Only consider if you had to label all our different members with a ticket bearing the name of their tribe. You would have to begin with the little wood-strawberry, who grows so near the ground that the Germans call her the earth-berry, and you would not finish till you had climbed the tallest apple or pear-

tree in your orchard, or clambered up to some cottage roof, where not only the blossoms of the banksia rose, but those of the dark crimson china rose, and the smaller many-flowered white briar love to unfold their pride and beauty. And now come back to-morrow and we will try and talk only about roses."

Part II.

"Now, out of the nineteen or more different kinds of wild roses," began Miss Dog-rose next day, "I am only going to introduce you to five, four that is, besides myself. One of them is a sort of twin brother of my own, that is, he is so like me in some respects that whereas I am called the Common Dog-rose, he is called the Trailing Dog-rose. And now, though I've heard some silly people say, when looking at my blossoms, 'What a shame to call her Dog-rose' I can tell you that we're very proud of that name, for it records, as it were, the good and useful deeds of our ancestors, for it was not by chance that either the Greeks or the Latins called us each in their turn *dog*-roses; it was because they knew that our roots were valuable in curing the bites of mad dogs, and they loved and respected us in consequence."

"Then why don't people still use your root in that way?" asked Rhoda.

"I'm not sure now that our roots would be inclined to be so used," was the answer, and the little prickles on Miss Dog-rose's stem looked all at once rather fierce. "Folks have neglected us so long that I suspect *we*'ve forgotten our healing talents, and that our virtues have perished for want of encouragement, for flowers and humans are alike in that they are all the better for having justice done to their good qualities. But to return to the subject of my name; of the title of Dog-rose I *say* we are proud, but we do resent being called *Canker*-roses, a term of contempt which some of your village people in their ignorance give us still.

"My brother, the trailing dog-rose, you will easily distinguish from all his relations by his slender, trailing stem. He has also fewer prickles than any of us others, but then, on the other hand, his blossoms are scentless. Then comes the sweet briar, or eglantine, as the poets have christened her, the well-known fragrance of whose leaves betrays her whereabouts at once, and her cousin, the downy-leaved rose, so called frem the soft, downy texture of her leaves. She is also sometimes called the 'apple-bearing rose,' because her round fruit comes near to an apple in shape.

"And, lastly, we will mention the burnet-leaved rose, whose small, serrated* leaves are so like those of the lilac burnet (whom you remember gives his name to the fourth lesser tribe) that she is in fact better known as the burnet-leaved rose than by her old Latin name of Spinosissima, and yet her shoots, thickly set with bristles mixed with nearly straight prickles, make her very deserving of her name of Rose Spinosissima or the thorniest rose.

"Now hitherto, you know, you have only been taking lessons of what are called herbaceous plants, that is, roughly speaking, plants that have nothing woody about them; so it will be quite a change for you now to be taught by myself, who am a shrub.

"Now, a shrub means a low, dwarf tree, or perhaps I should say, a plant with several woody stems springing from the same root; and this, you see, is what I am."

"But you grow up so high," said Rhoda, "that your long stalks stretch ever so high above the hedge rows, just like giants' arms. You ought not to be called a dwarf."

* "Serrated," said Rhoda's book, means "notched at the edges, like a saw."

"For all that," was the answer, "I *am* a shrub, and a shrub is a dwarf tree. But you must not talk of my having *stalks*. We roses have stems, and those waving green arms of which you speak are called shoots, because they shoot out from our stem, just as those slender, running branches which grow out from the stem of the strawberry are called *runners*. But to return to my own stem. This is set with prickles, which are all alike in shape and size, and are hooked. Now these little prickly claws have their use, for it is by their help that we manage to climb and so secure for ourselves all the light and the air necessary for our well-being.

"The blackberry-bramble has her share of prickles or climbing claws, as we call them, amongst ourselves. But though our *stem* is prickly, we Dog-roses don't allow our shoots to wear any bristles, and in this respect the downy-leaved rose follows our example. The trailing dog-rose, on the contrary, encourages its young shoots to put forth their own feeble prickles, so also does the eglantine, whilst the burnet-leaved, as might be expected from the thorniest rose, not only supplies her shoots with innumerable bristles, but mixes them with nearly straight prickles as well.

"And now I want to tell you about my elegant leaves, which have such a slight down upon them that

they might almost be described as smooth. As each leaf is, you see, made up of five separate leaflets, we roses are said to have *compound* leaves, which is the term always given to leaves divided into distinct leaflets.

" Each of these tiny leaflets have serrated or notched edges, which is the case with nearly all the leaves of our rosaceous tribe, and they are very gracefully arranged on their own leaf-stalk. Two pairs are placed opposite each other, with the fifth leaflet at the point, to finish off the leaf as it were. Moreover, the base of our leaf-stalk is furnished with two little sheathing oblong wings, which are called *stipules.**

"Our next step brings us to my calyx, which is not only very beautiful, but which forms a very important part of our blossom. Wise folk, I am told, are still squabbling over what is my pure calyx and what is not, so perhaps, the day will come when you will pass me by with a shake of your freshly-crammed heads and say that I taught you all awry about my flower-cup.

"Nevertheless, till that day comes, you may as well believe what I tell you.

"That green, fleshy, urn-shaped tube at the top of my

* "Stipules," whispered Rhoda to Hugh, after consulting her book, "is from a Latin word meaning stem or blade."

flower-stalk, I call my calyx, some people call it the receptacle tube, and the five long elegant fringed leaflets which spring from the rim of that tube, and give such especial grace and beauty to my flower and bud, are called segments or divisions. Now instead of these segments being all alike they are curiously unlike each other, two having little leafy beards on both sides, whilst two are quite smooth at the edges, and one is leafy on one side and smooth on the other, and this peculiarity has led to the making of a riddle, which you may go and puzzle your home folk with, and I suspect if they havn't one of my calyxes just under their noses they'll never guess the answer. But before I tell you the riddle, I must finish what I have to say about the segments. In some of our tribe, they remain faithful to the calyx even after the flower has vanished, and the fleshy tube is gradually swelling itself into the fruit. This is the case with the apple, in which you can discover the shrivelled remains of the calyx segments in the little brown eye as people call it, at the top of the ripe fruit, or again the strawberry, where the fruit springing from the receptacle keeps its calyx segment like a little green fringe round its base.

"But amongst us dog-roses, those graceful leaflets have not alas! sufficient attachment to remain after

the best of the summer is gone, and our working days begin.

"Like summer friends then, they fall away and desert us. But we don't bear them any ill-will for it, any more than you do against the swallows, who come and go with the sunny weather, for if they are not strictly useful, they are at any rate very pretty. And now here is my riddle and with it the close of this day's lesson.

> "Of us five brothers at the same time born,
> Two from our birthdays, ever beards have worn;
> On other two, none ever have appeared,
> While our fifth brother wears but half a beard."

Part III.

"Now the more you learn of Botany, my children," began the Dog-rose, next day, "the more you will see how in the arrangement of every plant Dame Nature seems to have had one prevailing number running in her mind. Sometimes it is the number four, as in the case of the cruciform or cross-bearing tribe, sometimes it is the number three, as in the case of the lesser celandine, where the sepals of the calyx are three, and the number of the petals

nine, or three times three; but I think more often than not, that five is her favourite number. At any rate, I have a right to think so, for not only are my leaves made up of five leaflets and that number repeated for my calyx segments, of which we spoke yesterday, but my corolla is also composed of five petals.

"These petals are separate from each other, as you may often have observed, when one or other of my petals may have fallen away without disturbing the others. Now just look at one of my rose-leaves as my petals are often called; the edge of each you see, is slightly cleft in the centre, and varies in tint, from the purest white to the most delicate rosy colour. Now although you are such new-comers into this world of ours, even you must often have heard of the beautiful, sweet-smelling water, which our rose-leaves yield when they have been dried in the sun, and the rarer and most exquisite scent called 'attar of roses,' made from my sisters over the sea, and perhaps some day, if you travel into the land of the rising sun, you will be given a sweet sort of jam to eat, all made of rose-leaves crushed with sugar, which some people tell you is very nice, and others declare is very nasty.

"And now, though it seems a shame to say so little about my beautiful petals, we must hasten on to the heart of my flower. Now is it not pretty with its ring of golden stamens surrounding that little emerald green pistil in the centre, consisting of the stigmas of many separate carpels seated on the top of my flower-stalk. Now can you tell me what a carpel is?"

"Oh, yes," said Rhoda, "a carpel is a little green body, rather egg-shaped, and contains inside it a very tiny pale coloured grain, fastened by a thread to some part of its covering. A carpel is really a little seed-vessel in itself, is it not Miss Dog-rose, and has its own style and stigma, only sometimes they're not very clearly to be seen?"

"Quite right," said Miss Dog-rose, "only remember the covering of *my* carpels is not green, but whity-brown, for if you recollect, I said that green emerald in my centre was formed of the *stigmas* of my carpels, not my carpels actually, you will hear more about them presently. Now look at my stamens, they are too many for you to count, and are fastened on to the calyx, so that if you wished to pull my flower to pieces, though you would find it an easy matter to pull off the petals and leave the stamens behind them,

directly you tried to detach my calyx or flower-cup, you would bring the stamens along with it.

"Now it would be just the contrary in the case of the buttercup. You might pull off both her petals and calyx, and still her stamens would remain seated firmly on the receptacle at the top of her flower-stalk. The difference as to where the stamens are fastened in a flower, *whether to the calyx or to the receptacle*, furnishes one of the most valuable distinctive marks to guide botanical folks in their arrangement of flowers.

"And now I will tell you a useful secret. All of us flowers who have our stamens fastened to our calyx are well-disposed and harmless to humans and animals, whilst those who can spare their calyx without losing their stamens with them, are hurtful and more or less poisonous.

"Now the useful part of this crowd of stamens, is to be found, as no doubt you know, in the anthers or little pouches of pollen, which each thread carries on his head. The contents of these little anthers will in due time be scattered on the sticky part of the stigmas, and then the manufacture of my seed will begin. And now let us look more closely at our pistil, which, as we said just now, was formed

of many carpels. Now these carpels, instead of growing at the top of the stalk in an ordinary way, —after the fashion of the buttercup for instance,— spring from the sides of the hollow calyx tube.

"Each carpel being, as you said above, a small ovary or seed-vessel in itself, is furnished with its own style or column, which ends in a little round green knob, which forms the stigma. The styles of these carpels are long and stiff, and you may observe them pushing their way through the narrow opening at the top of the hollow calyx tube, so as to bring their green ball-like stigmas in to the centre of the golden stamen ring. The carpels are entirely separate from each other, and become quite hard and horny when ripe.

"And now I wonder if you can guess what my calyx will turn into in the end. Its segments or five green leaflets, as I told you yesterday, will fall away, but that part of the flower-cup which grows so closely to my receptacle, that it is hard to distinguish where the hollow calyx tube ends and the receptacle begins, will remain at the end of my flower-stalk firm and immovable. First, my delicately-tinted petals one by one will drop from their green setting, and only my stamens will remain like a tuft of pale golden

hairs at the top of my calyx, but in time these will vanish too, for their anthers will have shed their pollen on the stigmas, and having accomplished their duty to the full, will leave my central organ to do its own work in turning that pollen to seed.

"And, meanwhile, my calyx will not only have been slowly swelling, but its green colour will have flushed itself by degrees into the brilliant scarlet hip so familiar to every country child. If imperial babes are said to be cradled in purple, surely we bestow imperial honours on our infant seeds, in wrapping them round so tenderly in such gorgeous swaddling clothes.

"You know the look of those little seeds, or rather carpels of ours, well enough, I am sure, too well perhaps if you have ever been tempted by the brilliant colouring and soft pulpy outside of my hips to put one whole into your mouth, and have suddenly found yourself nearly choked by those little carpels, which would stick in your throat, for their silky, bristly covering are not intended to suit the inside of little folk's throats.

"Ah! the birds are wiser than you, for they content themselves with pecking at the *outside* only. When my carpels are fully ripe they become very hard and horny, almost like little stones. It is a good thing for them

that they are so well protected, and I will tell you why.

"Our pretty scarlet hip does not open of itself to scatter its seeds abroad, and even if it did, so many young seeds falling in one place would have a poor chance of finding food and lodging for all, as you saw, no doubt, in the case of the compound flowers, so the birds do the work of sowers amongst us. Haven't you often observed them pecking away at the soft fruity outside of our hip, and thus, whether they will or no, scattering our seeds, one here, and another there, where each will find plenty of room to flourish.

"And thanks to the strong travelling overcoat in which Dame Nature has clad these baby seeds, they suffer no harm even from the pecks of the bird's sharp beaks or from being thus flung about at their will by these feathered sowers. Amongst the strawberries and the blackberries the birds perform the same service."

"And what about the apples?" said Hugh.

"That I will tell you about to-morrow," said Miss Dog-rose, "for our lesson to-day has been long enough."

Part IV.

"So it is about the apple you want to hear to-day," said the Dog-rose. "Well, it is rather a different story with him. To begin with, instead of having, like myself, more carpels than you would care to count, the apple has only five, which grow on the top of its flower-stalk. Now when *my* rose fruit ripens, only the covering of my hollow calyx tube becomes fruity, and the carpels, as I explained to you yesterday, lie each separately in the inside, whereas in the apple, the calyx tube and the coverings of the carpels all intermingle and grow so fleshy together that it is difficult to tell where one ends and the other begins."

"But then, please, Miss Dog-rose," interrupted Rhoda, "each time we eat an apple, do we eat the whole seed-vessel of the apple blossom?"

"Of course you do," was the answer, "but I hope you don't swallow that harsh, horny substance, which you call the core and which is really the inside lining of the covering of the seed. Now you know, of course, what the seed of an apple is like?"

"Oh! yes," cried both children, "the seeds are those little brown pips, but what a deal the birds would have to peck through before they reached them."

"Exactly," answered Miss Dog-rose, "and so though

the apple has what is called an indehiscent seed-vessel, that is one that does not open of its own accord to let fall the seeds within it; those little brown prisoners shut up within the apple's horny-lined heart know well enough that their release will come in due time, and this will be when the apple falls to the ground and lies gradually rotting there, till at last the whole of the fleshy covering of their dungeon walls fall away and the seeds lie free and uncovered on the soft lap of mother earth, with nothing to shut out their view of the blue sky overhead. This is how our apples manage their seed department when they grow wild as Dame Nature first made them. Now, of course, that she has allowed gardeners to dabble with them, these latter seem to have found other ways of making new apple trees, without so much as using the seeds of the old ones. But there, I am only a simple wild child of nature, you know, and I don't understand what is meant by grafting and inoculating and what not. Any more than I understand, what some of my neighbour roses mean, when they talk of their brothers and sisters, who have been *budded* on to some garden stock and have turned into grand garden roses.

"You'd better go and ask your gardener all about that. Out here in the hedges we don't want to hear

about those sort of tricks. I, for one, shall never believe that any smart dresses can make amends to our hedge-side blossoms for being condemned to live as prisoners within garden walls instead of growing fair and free out here, with no pruning-knife to cut short their pretty twining arms, no garden scissors to snip off their beautiful blossoms before even their soft pink petals have warmed themselves through in the summer sunlight. Only one more word and then my long story will be told.

"Now you must often have seen a little green, mossy tuft, beautifully tinged with crimson, growing on my branches, which you could call neither leaf, flower nor fruit."

"Oh! I know," cried Rhoda, "we always call them robins' cushions."

"I daresay, but for all that you would be sorely puzzled to say what that little tuft consists of. Nor would its soft pretty outside ever lead you to guess what was inside it, for if you were to cut it open you would find it quite full of small worms!"

"Oh! how horrible, cried the children; "but how did it all happen?"

"Ah!" answered the Dog-rose, "this strange growth on our branches was the outcome of one

little fierce prick from a small insect, made in our stems when they were young and soft, and therefore easily wounded by an enemy; and along with her cruel prick, the insect deposited her eggs, which eggs turned later into those little worms which fill my mossy tuft. The wound was hard to bear, and those nasty little eggs rankled in our stem, as perhaps the remembrance of unkind words rankle in your hearts, when they have accompanied some cruel blow. But now, my children, take a lesson from us. We couldn't get rid of either the insect's wound or her eggs, but for all that, we didn't mope or lament ourselves, but we set to work to bandage up our wound with the prettiest feathery sort of trimming that a fairy could devise, and we determined that whatever secret soreness we might feel, no passer-by should ever guess at it.

"And so, you see, our own private troubles, silently borne and made the best of, have really only added to our outward beauty, for there is no one in the world who doesn't admire our mossy tufts, so beautiful have we made our grievances.

"And they're not only pretty, but the doctors will tell you they are very useful in staunching wounds, so that you see by bearing our own wounds bravely,

we have learnt to become useful in curing other people's.

"And now, though my lesson has been such a long one, there are still so many things you should learn about our Rose tribe, that I would advise you next year to study very diligently amongst the members of our other lesser tribes, to whom I have not been able to do more than allude. You should try and make acquaintance with the sweet Queen of the Meadow, and the pretty cinque-foils and sundry of their relations."

"Yes, that we will," promised the children; "and thank you very much, Miss Dog-rose, for your lesson. We seem to have learnt such a lot of things from you, that we are very glad we have a few notes in Lady Science's little book to help us to remember a few."

And that evening, as Rhoda wandered about the garden paths, where the air was heavy with the perfume of those roses which she had now learnt to consider as namesakes of her own, she read over and over again the following notes:

DOG-ROSE.

Class, Dicotyledon; *tribe*, Rosaceous; *family name*, Rosa Canina; a *shrubby plant*.

Stem, prickly, putting forth smooth shoots without bristles.

Leaves, compound, composed of five leaflets, serrated.

Calyx, composed of hollow tube, seated on top of flower-stalk, and having five segments, which do not remain attached to the fruit.

Corolla, divided into five petals, separate from each other.

Stamens, numerous.

Central Organ, pistil of many separate carpels, seated on the hollowed top of the flower-stalk, having long, stiff styles, with round, green stigmas.

Fruit of Rose, called hep or hip.

CHAPTER VI.

MASTER PEAS-BLOSSOM.

"Your name, honest gentleman?"
"Peas-blossom."
"Good, Master Peas-blossom, I shall desire you of more acquaintance too."

—*Midsummer Night's Dream.*

"WELL, Hugh, I don't see that we've any choice but to turn back to the kitchen garden. I dare say it is hard work to be climbing all day, but I do think Miss Everlasting Pea might have at least spoken civilly to us."

So spoke poor Rhoda, as she and Hugh tramped homewards one particularly hot summer's day. Rhoda was very flushed, and both children looked cross. The truth was, they had been on a long expedition to find the narrow-leaved, everlasting pea, in the hope that she would give them a lecture on her tribe. But that lady had shaken her greenish-yellow blos-

soms, tinged with purple, quite savagely at the little people, and had bidden them to go elsewhere for their information.

"Don't you see I'm hard at work," she cried; "climbing, climbing all day. I have no nice, ready-cut sticks to help and support me through life as our pampered relations in your fine gardens have. I and my near relations have to clamber up the hill of life as we can, clinging on for dear existence with our little green hands, which you call tendrils, and with no time to spare, I can tell you, for telling our family history. If you take my advice, you'll leave us poor wood and meadow folk in peace, and will go and tease that fine white-faced gentleman, the garden Peas-blossom. He has actually two-legged people kept to wait on him, who cut up whole trees to help him to grow with no trouble to his lazy self. Yes, yes, my little friends, trot off to him and leave me in peace, or I shall certainly ask my good cousin, the golden broom, to sweep you out of my way, or perhaps his half-brother, the gorse, would lend a helping hand with his not over-friendly prickles."

Her tone was so threatening, that Rhoda and Hugh lost no time in turning their backs on their new

acquaintance, and making the best of their way to their own kitchen garden.

"I hope," said Hugh, "that those rude manners don't run in the family."

But he need not have been alarmed.

"So you've come nearer home to-day for a lesson," said a sweet little voice which seemed to match very well with the white petals of the pretty peas-blossom. He nodded to the children in quite a friendly way from amongst the green leaves and half filled pods around him, for the children were standing now amongst a whole row of pea-plants climbing up their sticks. The white flowers dotted about amongst the green leaves looked so much like white butterflies that when little Master Peas-blossom began his remarks by saying that they were often called Butterfly flowers, both Rhoda and Hugh agreed that it certainly was a very good name for them.

"Then are you called the Butterfly flower tribe?" they asked.

"Not exactly. Properly speaking, wise folks call us the *Leguminosæ*, from a Latin word, which means that our fruit is gathered by the hand, not reaped with the sickle, for instance, like wheat or barley. But if you think that is a very long word, and don't want

to talk as wisely as the wise ones, you may content yourselves by calling ours the pea and bean tribe.

"We are a very large and important tribe, and our members vary in size from those tiny vetches which grow in the hedge-rows, to the stately laburnums with their pale golden tresses, or the thorny acacias with their milky white blossoms, whilst over the seas our cousins, the locust trees, have such enormous trunks that fifteen Indians, with joined hands and outstretched arms, cannot span one of them.

"But it would take me too long to tell you half the beauty or uses of the members of my tribe. Only think, we reckon at least 6,500 families as belonging to us, and probably there are more whom we may have lost sight of. I and my nearest relations, the peas and beans and scarlet runners and lentels, give many tempting dishes, welcomed alike at the table of rich and poor; my cousins, the clover and the field-vetches, are loved by the cattle for their leaves, and by the small birds for their seeds, whilst my foreign relations give you gum arabic, tamarinds and liquorice, * (for which, if you have ever had sore throats, you have learnt to be thankful), as well as senna, whose leaves make that tea of which no one asks for a second cup,

* Liquorice is also grown in England.

and the balsam of tolu, so good for coughs, and many other medicines, the use of which you may find out some day for yourself. The indigo too, that rich blue dye, is sent over here both by my East and West Indian relations, and the Tonka Bean and the Balsam of Peru, both well-known perfumes, are yielded by foreign members of our tribe. It is easy to recognise a large number of us, for with few exceptions, we all bear our seeds in pods, and have our leaves arranged in the same way.

"Like other large tribes, however, ours is divided into groups or lesser ones, and of these we have three.

"*The first* is called the Lotus group, which is the Greek name for the well-known 'little bird's-foot trefoil,' with its bright yellow flowers and crimson tipt buds, and with its seed-pods spreading out from one centre, just like the claws of a bird. He is so completely the darling of the group that he gives his name to this lesser tribe. In this division belongs, too, the furze or gorse, whose beautiful golden flowers you have seen so often glowing on his dark green prickly stems, that I need not stay now to describe him. Then comes his cousin the common broom, with his thousands of golden blossoms gleaming, like a shower of yellow butterflies,

on the green boughs. The bees love these broom flowers well.

"And another member of this group is the rest harrow, whose small rose-coloured flowers are a very fair copy of those of my sister, the sweet pea, and whose Greek name, Ononis, tells you that it is one of the donkey's tit-bits. Nor must we leave out the trefoil—three-leaved, as its name tells you it is—or the clover, of which both sorts, the white and the purple, afford such valuable food for cattle.

The second group is called the Vetch group, and contains a great variety of vetches. To this lesser tribe I and my next door neighbours, the broad bean, properly belong, for we peas and beans are very closely related to the vetches. The connecting link between myself and them I consider to be the handsome everlasting pea, whilst the broad bean comes very near to the common vetch; being, in fact, himself nothing more nor less than a cultivated vetch.

"*The third* group contains only three families, and is called the *Joint-Vetch* group, because their seed-pods are divided into many joints. That is to say, the bird's-foot and the horse-shoe vetch have jointed pods, but the third and most remarkable member of the group, the saintfoin, has a straight, one-celled,

one-seeded pod. Its richly-tinted spikes of crimson flowers flourish so well upon this chalky soil that you must often have seen this handsome cousin of ours hereabouts.

"And now," went on Mr. Peas-blossom, "having paid a flying visit to some of the best known members of our tribe, it is high time to come back to myself and those near neighbours of ours, the delicately-tinted sweet peas. Some of my sisters here envy those sweet ladies for their pretty dresses of pink and lilac and crimson, as well as the gaily-clad lupins and milk vetches, all of which grow in your own flower garden, and are near relatives of each other."

"But please," said Rhoda, "though you have told us the name of your big tribe and of your little tribe, you've not told us your particular name."

"Well, I suppose I may say," said Master Peas-blossom, "that my family name is Lathyrus. It was brought over, I believe, by my ancestors from Greece, but though they brought the name, they either forgot to pack up the meaning along with it, or else lost it on the road. Anyway, as I've never heard a satisfactory explanation of it, I won't insist on your calling me by it. If your call me Master Peas-blossom that will do very well, and now having settled that point we will

say 'good-bye' to each other for to-day, and begin work to-morrow in real earnest.

Part II.

"Do you know, Master Peas-blossom," began Hugh, next day, "that I saw you and all your brothers and sisters being sown in these long rows. I watched our gardener putting the little shrivelled peas into the ground, so I know quite well how you began in life, though I do rather wonder how all your leaves, and your long stalks, and flowers, and pods could come out of that wretched-looking little pea."

"Ah! if you had been popped into the narrow furrow along with the 'wretched little peas' I will tell you what you would have seen," said his white-faced tutor. "Gradually appearing on one side of that despised seed, you would have seen a white fleshy thread pushing his way through the brown overcoat of the pea. This thread is called a *radicle* or baby-root. It comes out very slowly and cautiously, and always points downwards into the soil. When it has grown the length of one barley-corn, a fresh start as it were, is made from the point where the radicle first started

from the pea, so that presently the white fleshy thread will be seen lengthening in two directions at once. *Downwards* to form the root, and *upwards* to form the stem.

"The downward part will become covered with little root-hairs, and will run as fast as it can to bury itself out of sight in the ground.

"The upper part, on the contrary, will push its way upwards, eagerly seeking the air and light, by whose help it will by-and-bye develop in regular order, stem, leaves, blossoms and pods. When you grow a little older, my children, you will be much interested in studying how root fibres are formed, and all their curious contrivances for feeding the plant. I should very much like to tell you all about my quite baby days, but perhaps it is wiser to teach you only just enough about ourselves now, to make you anxious to find out more for yourselves by-and-bye. So I will only explain to you as simply as I can, why, when my stem first appears in the world, it is ushered in by two thick seed-leaves, quite unlike the other leaves which will presently unfold themselves, and which only stay long enough to see their nursling in a fair way to thriving without them.

"But first of all, what do these two seed-leaves tell you about the class to which we belong?"

"That it is the Dicotyledon class," said both children.

"Right," said Master Peas-blossom, "now you must have heard from other plants how they draw in some portion of their necessary food through the mouths of their little root-fibres, and part from their leaves. In fact, the root-fibres and the leaves act, so to speak, as provision merchants to the rest of the plant.

"That's all very well, you will say, when the plant is old enough to have leaves and the root-fibres have developed their small mouths, but until all this has taken place, how is the baby stem to be fed, and the plant kept alive?

"Well, Dame Nature thought of all that you see when she provided the seed with its two cotyledons or seed-leaves, those thick fleshy leaves of which we spoke just now, and who have enough food stored up in their tissues to serve as nourishment for the infant plant till it is old enough and strong enough to take care of itself. Then, when they have fulfilled their mission of nourishing and protecting the tender shoot, my two cotyledonary leaves wither and die. And now for my stem. This, as you can see, though active enough in climbing, is but a poor weak creature.

She is what you would describe as wanting a backbone, and so she is very thankful for the support of these kindly sticks, round which she clasps those little green corkscrew-like arms, which you call *tendrils.**

"And these tendrils are not the only supports which kind Dame Nature has given as extra helps to my feeble stem, for do you see the long sort of leaf that she has provided at each side like a wing, in order to widen the stem, as it were, and so make it a little more powerful.

"My leaves are what are called compound, being composed of several leaflets. These leaflets, being ranged along the opposite sides of the little stalk that runs up between them, are called *pinnate*, from the Latin word for feather, as perhaps you have heard before."

"Oh! yes," said Rhoda, "because the stalk in the middle of the leaves is like the bit of quill which runs up the centre of a feather."

"Exactly," said Master Peas-blossom. "Now, although amongst those members of our tribe, whom you are likely to meet, you will find they have

* "A tendril," said Rhoda's book, "means something that holds, from the Latin word 'teneo,' I hold."

pinnate leaves, from the tiny vetchling to the tall acacia with her elegantly cut foliage, you will observe that one great distinction is to be noted between the arrangement of the leaves of the climbing families like myself and those, who like the lupin or the saintfoil, do not climb. For whereas the leaves of the latter are finished off neatly with an odd leaf at the top of the central stalk, our leaves have no odd leaflet, but end in one of those twisted corkscrew-like tendrils, which are so useful in helping us to climb."

"But," interrupted Hugh, "surely, Master Peas-blossom, the clover, and the gorse, and the broom have none of them, pinnate leaves?"

"I was just going to say so," replied Master Peas-blossom, "if you had left me the time to speak.

"And now I will go on with the description of ourselves.

"You see on what a slender footstalk we blossoms grow, so slender that you might almost wonder how it can bear the weight of our beautiful flower, but we should not look half so like butterfly blossoms if we grew on a great thick stalk, like a cowslip stalk for instance. And what is really of more

importance, is, that our blossom could not twist itself so easily out of the way of every cross wind if we had not such a long flexible footstalk.

"My calyx or flower-cup is all in one piece, but it is cut into five very pretty little points, and my calyx remains seated at the end of my flower-stalk, long after all vestige of my white petals have disappeared.

"But if you were to set to work to pull off my flower-cup, you would find that it contained the five petals of my blossom, each of these blossoms being furnished with a little foot, not unlike the claw of Mr. Wall-flower's petals, by the help of which each petal can obtain for himself a firm footing in my calyx.

"But my flower-cup, unlike that of the wall-flower, has both our stamens and corolla fastened to it, and does not shift the duty of supporting them on the receptacle, as is the way with many flower-cups in other tribes.

"As regards our corolla, however, and all its mysterious arrangements, I will tell you to-morrow, and unless I am very stupid at telling my own concerns, I hope you will think it is almost as good as a fairy tale."

Part III.

"Why don't you stay at home and take a lesson from us?" cried a crowd of sweet-peas, who grew together in a tangled plot outside Rhoda's nursery window, and certainly they did look a very pretty lot of teachers, with their pink and white and crimson and purple blossoms, all twining in and out of each other at will.

They were so pretty and so attractive indeed that for a few moments both Rhoda and Hugh were half inclined to accept their invitation and stop short on their way to the kitchen garden.

"After all," said Hugh, "I think our friend Master Peas-blossom is very insipid-looking."

"Oh, but Hugh," said Rhoda, "he *was* good to us when the vetch was so rude. I think it would be mean to desert him now, just because he is not so smartly dressed as his sisters."

"All right," said Hugh; "but I'll take this one with me, for she's so awfully pretty," and so saying Hugh broke off one lovely blossom, dressed in deep crimson and tender purple and creamy white. "Now you know," went on Hugh, "if they were a couple of dogs these two pea-flowers would just growl at each other; but I'm afraid they won't show fight, though it would be good fun if they did."

On the contrary, however, the white-robed peas-blossom seemed quite pleased to have such a close acquaintance with his princess sister, and when Rhoda twined the latter's little footstalk in amongst Master Peas-blossom's own tendrils, so that the two flowers nestled quite near one another, the gentleman of the kitchen garden nodded his head quite approvingly, and declared the newcomer would be of great assistance in the lesson he was going to give.

"It will be just as if I had a painted illustration to show you, my dears," he said, "instead of myself, who am hardly coloured at all. Your ladyship," he added, turning to the sweet-pea, "will not mind personal remarks I hope, for I propose to discuss your various limbs and features."

As her ladyship nodded condescendingly, Master Peas-blossom began at once.

"In our family, as we said yesterday, the corolla is fastened into the calyx, and is composed of five pieces or petals. All these petals are so unlike each other that they have names of their own. This large, deep rose-coloured one," and the Peas-blossom pointed towards his visitor, "which stands upright and unfurled above the rest of our flower, is called the standard because it is like a beautiful banner lifted high, whose colours

gleam above all the rest, whilst the name of wings is given to those two long, slender lilac petals, which project in front of the standard and lean towards one another so lovingly as almost to meet.

"Within this pair of protecting wings are the two lowest petals, of a creamy white colour with a tinge of green, fashioned so wonderfully like a little boat, with its pointed base to form the bottom of the little ship and the tiny beak at the end for its prow, that this lower pair of our petals is always described as our keel. Indeed, to my mind, though people call us butterfly flowers, we are much more deserving of the name which some old village people give us still of 'boat-flowers,' for I am sure we are uncommonly like the boats which the fairies use to sail through the summer air in; and many people call that large upright petal our sail instead of our standard, and indeed it answers the purpose of one. Did you ever observe one of our blossoms blown about on its long, thin stalk in a high wind? From whichever quarter the blast comes the good protecting petal did the work of a sail, twisting itself round to catch the wind and breaking the brunt of the bad weather with its own broad back, and thus placing itself as a screen between the wind and the delicate centre of our flower.

"Now, at first sight you might fancy that these slender lilac petals which form the side leaves of my flower, and are called *wings*, were joined together, but this is not so; they are really perfectly separate, and inside of each there is a tiny hollow and also a little lump.

"The uses of these you will see in a minute, for if you have sharp eyes you will discover that in each of the lowest pair of my petals, which form the most boat-like part of my flower, there is a little lump which exactly corresponds with or fits in to each of those tiny hollows in the wings above, whilst there are also curiously-winding little hollows — like the rambling passages in an elfin palace—which are made on purpose to suit the small lumps in the side leaves. It is in fact, by means of these clever contrivances of lumps and hollows that these four petals fit so tightly that if you pulled them roughly you would see that, like faithful friends, they would rather be torn in pieces than ever be separated from each other.

"And now what do you suppose that little boat holds? For I can tell you that, frail and delicate as it appears, it is no mere pleasure-boat, but carries all the valuable merchandise of our blossom, for if you were to take a peep inside that fairy vessel you would see the central

organ of my flower safely stowed away out of reach of wind and weather.

"But this brings us to the business part of our lecture.

"We have talked of our rose-coloured sail and pale lilac wings and the tiny boat, whose colour and texture reminds one only of a white butterfly's wing; but all that wouldn't go far towards making pea-soup or pease-pudding for a hungry man. When, however, the time comes for our petals to wither and——" But here Master Peas-blossom suddenly broke off, and pointed with one of his tendril fingers towards his gaily-painted sister, who at the lecturer's last words had uttered a faint shriek and thrown herself on the ground.

"Ah! poor thing," continued Master Peas-blossom, "I forgot she couldn't bear any mention of the time when her bright colours would fade and decay, for she is one of those folks you know who cannot bear the thought of old age; and it is very natural too. She and her sisters you see have only lived for the sake of their gay dresses, and have spent all their lives in making their outsides bright and beautiful, so that within their hearts they have laid up little store to be turned into fruit in their old age.

"Well, well, they take their reward in the early

morning of their life, when everyone loves and praises them for their beauty, and as I don't want to pain my poor sister any more by talking of days whose approach is painful to her, I will cut my lesson rather short for to-day, and to-morrow I will talk simply about my own blossom."

Part IV.

"So now I am going to invite you to step inside my fairy-boat," began Mr. Peas-blossom, on the following morning. "Here lies my pistil, like some great prince surrounded by his courtiers, and is composed of a single ovary, a single style, and a single stigma. It is shaped, as you can see, like a longish, rounded pod with a curved neck, which he stretches out in a little brush-like stigma beyond the stamens or dust spikes.

"Now you can guess, I am sure, from looking at my pistil, that it will grow into the pod in time, where those little green peas will dwell, whose acquaintance you must have made long ago.

"And now let us look a little closer at our Prince Pistil's host of courtiers, of whom you may count

ten, each bearing his golden casket on his head. That casket (which, as you know, is the anther or tiny pouch filled with the precious pollen which turns later into seed) opens by two little slits which are turned inwards towards the centre of my flower.

"And now see how lovingly these courtiers cling round their monarch, nine of them indeed clasping him so tightly that they form quite a sheath round the pistil.

"Only the tenth, the uppermost one of the party, and the one that is placed exactly under the sail, stands aloof and seems to look down upon his nine brethren; but the truth is, he is neither proud nor sullen, but is standing on duty in that rather exalted place.

"In due time, these little caskets will empty their golden store upon the pistil, whose thick, brush-like stigma will catch the life-giving dust, and sweep it carefully into its long, narrow style, which afterwards grows into the pod. The bees, too, who come to and fro in quest of the drop of honey they find in our hearts, help no doubt in the work of carrying the pollen within reach of the stigma, for more by luck than by cunning, they drop some of that golden dust which hangs about their small persons

and tells tales of their honey thefts, upon our stigma as they fly in and out of our blossoms, and this pollen is all treasure trove to my pistil.

"And meanwhile, whilst the golden dust is being gradually turned into seed, my pistil becomes larger and larger till it outgrows that little boat in which it was once so comfortably cradled. Then it is that the time has come for the tenth little stamen to fulfil his duty, which is that of breaking through the ring which the other stamens have drawn so tightly round the pistil, so as to give a little breathing space to the poor, closely-confined prince.

"Having been from the first loose and detached from his brethren, our tenth courtier is able to do this easily, and isn't the pistil thankful to him for making this opening?

"But from that time, his days are, so to speak, numbered, for our seed-vessel is growing larger and fatter, and people come and look at us and wonder when the first dish of green peas will be ready.

"For the pod—which I daresay if you ever help cook in pea-shelling you love to crack open—is nothing more nor less than our seed-vessel, divided, as you can see, into two divisions. This contains the seeds —which you call peas—fastened each to a tiny thread

to *one* side of the pod only. The thread is the small fibre which feeds my baby seeds whilst they are growing within their green seed-house.

"Of course, living here in the garden with gardeners to wait on us and gather in our seed, and plant it again in due time, we have no need to be our own seed-sowers, but it is different in the case of my wild relations.

"Many of these bear their seeds in pods like my own, which, when they are ripe, open noiselessly, and by the splitting asunder of their seed-vessel or pod in two divisions, as you have have often seen our pea-pods split, let fall their fruit or seed upon the ground.

"But there are other members of our tribe, notably the golden gorse and his equally golden, though non-prickly cousin, the broom, who scatter their seeds in a much more sensational fashion. If you have ever been on a gorse-covered common when the late summer sun has been at its hottest, you must have heard a crack, crack on all sides of you, as if the fairies were letting off a succession of fireworks in broad daylight, or rather, perhaps, as if some invisible elves were having a rifle practice, for if you listened, you must have heard the sound of something falling, like dropping shot amongst the grass.

"And then, perhaps, you may have come near enough to some golden-studded gorse bush to have seen one of the little black seed-pods of an older generation of flowers on the very point of firing off his seed. In a second the two sides of the tiny pods coil themselves up in the heat of the sun, and shoot out the seed within them far and wide.

"Queer little black soldiers, are they not? Next time you want an excuse for a long walk, my dears, go up on the downs when the sun is bright and warm and watch my cousin's rifle practice.

"And now, little folks, I don't suppose I shall have anything more to do with you till we meet each other again some day at your table, when you will probably goble up my eight or nine seeds along with dozens more, and never know that you are devouring all that remains of an old friend. But I'll forgive you for that, you may forget *me*, if you will but try and remember my teaching, and then I shall hope that my pains will not have been thrown away."

"Oh! but we won't eat you," cried Rhoda. "I know what I'll do, I'll tie a little bit of crimson silk round your flower-stalk, and so I shall know you apart from all the other peas-blossoms, and when there is nothing left of you but your little pod, and the gardener wants

to gather you, I'll beg him to leave your seeds to ripen, and then, next year, we'll sow them in our garden, won't we Hugh?"

And Rhoda kept her word. From that day forward the little Peas-blossom wore his rose-coloured scarf long after his own butterfly petals had been put off, and in due time his seed was gathered in and put by for next year's sowing.

And from always going daily to watch their little teacher, Rhoda and Hugh seemed to have no difficulty in keeping his lessons in mind, and hardly needed to look at the page given up to his description in Lady Science's book, nevertheless we will copy it here.

Peas-blossom.

Class, Dicotyledon; *tribe*, Leguminous, or pod-bearing; *group*, Vetch; *family name*, Lathyrus.

Stem, climbing; furnished with wings and tendrils.

Leaves, compound and pinnate, with stipules.

Calyx, in one piece, notched into five-pointed divisions.

Corolla, in five petals; called papelonaceous, or butterfly-like.

Stamens, ten; nine of them having their filaments united; one separate.

Pistil, single; with ovary and style and stigma.

Seed-vessel, a two-valved legume or pod, dividing in two halves.

CHAPTER VII.

MR. HEMLOCK.

"Oh! hemlock, are those dark spots on thy stem
The stains left there by ancient crimes?"

Beale.

"IS he really so horribly wicked do you think, Rhoda? the wickedest amongst all the plants?"

"Yes, Hugh, very nearly, quite the wickedest, I think. I believe he has murdered a lot of people, and his family could never have been a very nice one, for the *old* ancients used always to employ his great, great grandfathers as their executioners whenever any poor thing had to be killed you know."

"Oh! but that's jolly," cried Hugh; "I'm so sick of hearing of nothing but good plants. This dear old sinner will be quite a nice change."

It was rather a thundery day towards the end of

July when the above dialogue took place between our two little friends. They were going by appointment to take a lesson from a tall graceful hemlock, who grew at the end of a rather damp, low-lying meadow, not far from a little stream. He looked so uncommonly elegant, with his smooth slender stem and prettily cut leaves and white flowers, that it was hard to believe he was so very horribly, horribly wicked.

Nor was his voice what Hugh had expected the voice of a "dear old sinner" to be, as he opened his lesson by saying, "As I suppose I am the first member of my tribe with whom you have sought a close acquaintance, I had better tell you about my relations a little, before talking particularly about my own self.

"To begin with, my tribe is called the tribe of the Umbelliferæ, or 'Little Shadow-bearers,' because amongst the old Latins who christened us, Umbella meant 'a little shadow,' and fero 'I bear.' So by degrees we have become known as the Umbrella-carrying flowers, though as a matter of fact, we have very little of an umbrella about us except the spokes.

"Our tribe, which consists of no less than 267 different families, is made up of a strange mixture of good and bad characters."

"I should think," muttered Hugh to himself, with

a wicked little laugh, "that *you* must belong to the uncommonly bad ones."

"Well, we are divided into four groups, and of the first group, I, Mr. Conium Maculatum, otherwise known as Mr. Common Hemlock, am the chief. To speak the truth, I suppose we *are* a band of sadly lawless characters by nature, and have all done dark deeds in our day. To my group belong the drop-worts, the cowbane, the water hemlock, the fool's parsley, and the wild celery; blood-stained criminals all of them; yet the sanicle, whose very name bespeaks his healing properties, is also one of our number. As regards my boon companion, the celery, although he is reckoned a desperate fellow when in *our* company, yet when he has been transplanted into gardens and brought to a better mind there by some months' imprisonment in the dark underground, he becomes a great favourite with his gaolers. He grows very pale and sallow then, and corrects his poisonous qualities, which made him such a dangerous party when he was left at large.

"Of the second group, Prince Asafœtida is the head. He is a Persian by birth, and having a particularly unpleasant smell, was considered a very suitable person to take the command of this lesser tribe, whose members

are chiefly remarkable for their offensive smells. As most of them, however, are natives of the East, you are more likely to meet with them in your physic bottles than in your rambles, so we will pass on to the third group.

"This little knot of umbrella-carriers will, I am sure, find favour in your eyes, when you know that here King Caraway fills the throne, for here are all the good folks of our tribe put together; all the members of our tribe, you know, who bear seeds full of wholesome, fragrant oil. Next of kin to the caraway, whom you have met so often in cakes and sugar-plums are, first, the anise-seed, also to be met with in biscuits and sweets; then the dill, who comes to you often as a kind nurse to soothe tiresome pains; then the cumin, whose seeds have such a pleasant, warm flavour that your cook welcomes them gladly to season various dishes; and lastly, the coriander, whose seed, perhaps of all others, yields the most powerfully-scented oil.

"The fourth group contains what we may call the reformed characters of our tribe, such as the carrots and parsnips, which, however much you may welcome in your garden, I should advise you to leave alone in their wild state, and the parsley and the fennel, and the chervil—the latter so called from a Greek word which

means 'pleasant leaves;' the samphire, with his long fleshy leaflets and yellow flowers, whose young leaves. if gathered in May and sprinkled with salt and drowned in vinegar, make one of our best pickles; and last, but not least, the angelica, with whose candied hollow stems, I am sure, you must be well acquainted.

"Our blossoms vary in colour from white to yellow, as in the case of the flower of the parsnip, or pink as the flower of the hedge-parsley, or blue as in the sea-holly, but our favourite and most general colour in this country is white.

"Now there are many foolish people in the world who call nearly every umbel-bearing plant by my name of hemlock. This is doubly annoying to me, because if they would only take the trouble of looking at me carefully, they would see that I am most clearly distinguished from all the members of my tribe by having a perfectly smooth, spotted stem.

"Now, pray remember this, for I am the only umbrella-bearer in the whole of Great Britain who can say as much.

"My second name of maculatum tells you I am spotted, and when you have once studied me well enough to know all my characteristics by heart, you will see there is no excuse for confounding me with any

other member of my tribe except the caraway. The caraway, however, is so rarely to be met with in his wild state, that you're not likely to have a chance of making this mistake.

"Now if you will come to-morrow, I will tell you a deal more about my history, as well as a little of some of my neigbours' concerns."

"And tell us a little about the bad deeds that some of them have done," said Hugh.

"You are a bad little boy to like hearing of other people's wicked deeds," said Mr. Hemlock, "and I shouldn't satisfy your curiosity about any of them, I can tell you, if I did not think it right to warn you against ever making friends with certain members of my tribe who look a deal better than they are."

Part II.

Never before had Hugh been in such a hurry to start for his flower lesson as he was next day to reach his "dear old sinner," Mr. Hemlock, and he had hardly said "Good morning" to the latter, before he began, "Now please, Mr. Hemlock, tell me a dreadful story."

"Tut, tut," was the answer; "if you think I'm going

to talk scandal about my neighbours before I've taught you all about my own self, you're finely mistaken. Now set your brains to work to understand what I'm going to teach you to-day, and never mind the story, which I shan't tell you at all, if you don't turn out an apt scholar.

"Now hear what I'm going to tell you about my root. It is about as thick as two of your little fingers put together, and has strong fleshy fibres or root-hairs. These make it a very difficult matter, I can tell you, to root me out of the ground.

"My root smells exactly like the parsnip, and some of your learned folks can't decide whether it is poisonous or not. Some say they have boiled our roots and eaten them, and found them as nice and as sweet as garden parsnips. Others declare that only one or two drops of the milky juice of our root is enough to kill a small animal.

"See the difference of opinion! However, perhaps, as long as they can't agree, our roots will be left in peace. At any rate, I don't advise you to taste them.

"On one point, however, they all do agree respecting me, namely, that *I* am quite the handsomest of the poisonous umbelliferous tribe.

"My usual height is from three to four feet, though

some of my brothers, if they happen to grow in sheltered places, will reach double that height.

"And just see what a magnificent thing my hollow shining stem is, which is at least three inches round in its largest part, and which Dame Nature has painted so prettily with purplish red stains, that those who have once been introduced to me have no excuse for not knowing me again. Moreover, my stem is covered with a fine greyish powder or bloom, and after it has grown up some way from the root, it branches out considerably.

"The rough chervil, common enough in hedges, which has also white flowers and a spotted stem, is often mistaken for me, but besides other distinctions his stem is very hairy, whereas mine is beautifully polished. His name, as I told you, means 'pleasant leaf,' and so, I am sure, I ought to have a name meaning 'beautiful leaf,' for though you may have heard folks quarrel with my leaves for their colour, and call them a dull green, everyone must agree that nothing could be more elegant than their shape.

"They are what is called *thrice-pinnate*; thrice meaning three times over, as you know, and pinnate, divided like a feather, and everyone of these tiny leaflets into which the large leaf is cut, is worth

examining. Each of them also is notched in a feather-like fashion, and ends in a graceful point. These leaflets are more remarkable in our very large lower leaves, which have long, hollow footstalks of their own. Our upper leaves are more like the younger children of a family, smaller than the rest and given to climbing about; whilst the elder ones sit quietly in their own places and sheathe the parent stem at the base.

"It is said that when our leaves are bruised they smell exactly like mice, if so, *I* should say, mice must have a very pleasant smell.

"And now we come to speak of the umbel itself, about the carrying of which we have talked so much. Our blossoms, which consist of so many small white flowers, are said to be arranged in the form of an umbel. Now by an umbel is meant an arrangement of blossoms, where all the little flower-stalks start from one point and bear each one single blossom. As all the flower-stalks are of equal length, the flowers reach about the same level, as you may have noticed in the blossom of the ivy or cowslip, or onion. In these examples the umbel is called *single*. My umbel, however, is on a much grander scale, and is called *compound*, or composed of several parts, because each of my slender stalks,

instead of bearing only one single blossom, branches off into a second set of lesser flower-stalks.

"Thus my stem finds himself at last in much the same case as you might do if all the spokes of the umbrella in your hand were suddenly to shoot out into little umbrellas on their own account. So that, all at once, you found yourself carrying an umbrella with seven or eight smaller umbrellas growing out of it. That would be a very compound umbrella indeed.

"Yon will observe the tiny leaflets that grow at the foot of all my little umbels, and which look as if they had not had the courage to go more than half way round, and you will probably guess for yourselves that they are called bracts.

"As all agree that I am an excellent type or pattern of my family, you had better pay great attention to the description of my blossoms, as that will help you considerably in recognising those of my relations. Tiny as my separate flowers are, each has its own calyx, which is five-toothed, but so small as to be scarcely perceptible. My corolla is divided into five separate petals. Each petal having what is called an inflected point, which means bent inwards, and all five being by no means equal in size, the two outer ones being the largest.

"And now, tiny as my little flowers are, see how generously Dame Nature has treated each of them. She gives them not only five stamens apiece, but two pistils, each pistil having its own carpel, or seed case, style and stigma, so that in the midst of each tiny blossom you see the two small stigmas crowning the seed-vessels.

"My stamens, like the petals, are all seated on the seed-vessels, and by the time the anthers have showered their pollen on the stigmas beneath them, both stamens and petals fall away, and leave what ignorant people call my seed, and which does look very much like one, at the top of my flower-stalk.

"But, as even you ought to know by this time, Dame Nature doesn't send her tender baby seeds into the world in such a rough and ready fashion without a suitable covering, and so what noodles call *seeds* are only the cases which enclose the seeds, simply husks, and nothing more, you know. As we said above, my seed-vessel is composed of two carpels, which are fastened by their faces to the central stalk, from which they separate from below when the seed is ripe. Each carpel contains one little egg-shaped seed which is hung from the the top of its cell, and when the fruit within is old enough to fight its own battles in life,

the carpels split open on either side of the central stalk and allow the seed within them to escape at its will.

"But these carpels or seed-coverings are in themselves well worth a careful examination; observe first of all, how their outside is ribbed or striped with five little ridges. These look just like the furrows which a fairy's plough might make, and within these furrows you can see a hair-like brown line embedded in the skin of the seeds.

"Now each of these tiny lines is really a little long bag filled with oil, and it is in these oil-bags that all the flavour is contained, for which most of our seeds, the dill, caraway, and others, are so prized. If you were to cut across one of my carpels, and examine it through a microscope, you would see openings at the end of these little bags or canals, through which a dark-looking oil was slowly oozing. So you see, these dark little ribs on the outsides of my carpels are really oil-tubes, and of the greatest importance to my seed."

"And now, please," said Hugh, who had been careful not to interrupt Mr. Hemlock all through that morning, because he wanted to keep him in a good temper; "will you tell us some nice, dreadful,

horrible, murder story? Something really jolly, you know?"

"I can't promise to tell you anything jolly," said Mr. Hemlock, "but I could teach you how bad it is to be disobedient, by telling you how many naughty little rabbits my roots have murdered, or rather who chose to murder themselves by nibbling my roots. But I'll tell you a sad, not a jolly story about two small folk, a boy and a girl, who were playfellows."

"Is it about a murder that you did?" asked Hugh, eagerly.

"It was a murder, yes; but I didn't do it. I only saw it happen. That handsome-looking brother of mine, the hemlock water-drop, with his grand-spreading glossy leaves, and fine umbels of white flowers, growing yonder on the bank of that running water, he was the one who did the evil deed.

"He has large roots something like a small parsnip, and these, owing to the water constantly running past him, stand out nearly naked from the bank instead of being decently covered over with earth. More than one foolish cow has eaten those roots and killed herself in consequence, and I have been sorry for them, because, of course, *they* know no better. But it was different with the boy and girl of whom I am going to tell you.

"They were disobedient from beginning to end. First they were forbidden to go near the stream, and then they were particularly warned not to eat my brother's roots. They had plenty of bread and cheese to eat at home, so I'm sure they weren't hungry; they must have been simply naughty. Anyway, the boy took out his penknife and cut off a great slice from Mr. Hemlock Water-drop's roots, which he gave to the little girl to eat, and he so jeered her for being afraid of being poisoned, that, like a goose, she ate it, though not before her playfellow had put a still bigger bit into his own mouth.

"'Oh, I say, isn't it sweet and nice?' said one foolish child to the other, and so they went on eating as much as they could find.

"'We'll, come again another day and look for some more,' they said, as they ran home; 'but,' added the boy, 'we won't say anything about it at home, because they're silly enough to say it is poisonous.'

"'Oh, no,' said the little girl; 'but, oh! Tom, I feel very sick, and oh! the field seems all going round with me.'

"'Nonsense, Nell, that's like a fanciful goose of a girl; you go home and have your dinner and you'll be all right,' said Tom. 'I'm going home to mine, good-bye.'

"And home the boy went, but he never ate any dinner that day, or any other day again. Though he had laughed at Nellie, he very soon began to feel sick himself, and by the time he reached home, he was so giddy, he could not stand.

"'Whatever have you been doing?' asked his mother; 'eating some trash, I'll be bound!'

"'Depend on it, it's the heat and his work at school,' put in his old grandmother. 'I never have held to all that book-learning. What a shame it is to overwork the children now-a-days.'

"And whilst Tom was hesitating whether he would blame himself or allow the school to be blamed for him, his tongue swelled larger and larger in his mouth, and he soon found that he could not speak at all. So his people, not knowing what had made him so ill could do nothing to cure him, and before the doctor had had time to reach him, poor Tom was dead.

"'A clear case of poisoning,' said the doctor, shaking his head."

"And what became of Nellie?" asked both children.

"Ah! Nellie was a more truthful child than Tom, though she was equally disobedient, so directly she had got indoors, she confessed what she had done, and how she felt sure she had poisoned herself. And

her mother, being a wise woman, put off scolding her, till she had made her swallow something so very nasty that it made Nellie quite sick, but it saved her from being poisoned like Tom. And that's the end of my story," said Mr. Hemlock, "and I hope it will be a warning to you both."

"Oh, yes," they answered; but in Hugh's secret soul he was sadly disappointed at the tale. He had wanted to hear some real exciting murder, and he thought it was very dull only to hear of a naughty little boy, who after all was not so very unlike himself in wishing to taste forbidden fruit.

Still, for all that, Mr. Hemlock's little lecture was not wasted, for both Rhoda and Hugh took very good care to avoid Mr. Hemlock Water-drop's roots, and to warn others to do so also. And indeed they hardly needed the reminder of "poisonous" which Lady Science had had written in very large letters above the following notes in Rhoda's book:—

COMMON HEMLOCK.—POISONOUS.

Class, Dicotyledon; *tribe*, Umbelliferæ; *Group I.; family name*, Conium Maculatum.

Stem, hollow, smooth, stained with purple reddish spots, much branched.

Leaves, compound, pinnate.

Calyx, almost imperceptible; five sepals entirely united, growing on receptacle, joined to ovary.

Corolla, in five distinct petals, growing on ovary.

Stamens, five, separate, growing on ovary.

Pistil, two carpels, each having ovary, style, and stigma, united each side of central stalk.

Blossoms, borne on an umbel, that is, all the flower footstalks start from one centre, so that the flowers reach about the same level.

N.B.—The Hemlock has compound umbels, that is, lesser umbels growing out of the larger ones.

CHAPTER VIII.

MR. WHITE DEAD-NETTLE.

"I know a bank whereon the wild thyme blows."
—*A Midsummer Night's Dream.*

"A DEAD-NETTLE! well, that sounds as if he must be a lively sort of person," said Hugh; "how will a *Dead*-nettle set about giving us a lesson, I wonder? And if he is dead, why isn't he buried, I should like to know?"

"*I* never said I was dead," came the answer, rather to Hugh's surprise, for he had not given the little, white-flowered Nettle on the bank above him, credit for having such sharp ears; "it's only the silly name which you two-legged people have given me. As soon as your grandfathers found out that, as our leaves did not sting like those of our namesake, the great Nettle, we were not likely to pay them back for their insults, they set to work to call us all manner of rude

names. We were the Blind-nettle, the Dumb-nettle, the Deaf-nettle, and lastly, the Dead-nettle, which I daresay was only a sort of name made out of *deaf*, and with about as much meaning in it when applied to ourselves as any of the other names they picked out for us. Ah! well, we can afford to laugh at them, for we know that all you human beings are very thankful to our tribe for many sweet scents and pleasant flavours and wholesome herbs, and that your wise folk are bound to confess that, although we reckon over two thousand families in our tribe, there is not one of us who has ever done them an unkind turn by poisoning anybody, or even making them ill. Now my tribe is called the tribe of the Labiatæ, which is from the Latin word for *lip*, because the corolla of our blossom is fashioned exactly as if it had two lips. It contains the mint, whose leaves swimming in vinegar you have often eaten with lamb; the peppermint, whose flavour you know well enough; the cat mint, and all the mint families in fact. The thyme, on whose tufts of purple blossoms you must often have trodden when clambering up some breezy hill, and whose leaves you have perhaps as often met with in the stuffing of some veal dish. Then there is the basil, marjoram, and savory, all of which were pot-herbs well known

to your grandmothers, and duly valued by them. And the sage, the faithful companion of roast geese, and therefore surely a special acquaintance of yours; and last, but by no means least, the fragrant lavender, whose straight, grey spikes are dear to every one, and who, in addition to her sweet scent, gives her services to the doctor, and is highly prized by him. But the lavender, I must confess, is better known now as a garden flower, and along with my cousins, the blue and the red and the white salvia, is a great favourite with gardeners.

"The salvias, however, are after all, in spite of their grand dresses, only first cousins, once removed from their cousin, the homely old sage, with his grey, green leaves, which your nurses tell you are so good for cleaning your teeth, and so famous for the savoury lining of geese.

"Now I belong," went on the White Dead-nettle, "to the family of the Lamiums, whose name means a throat, and I am called by learned folk, Mr. Lamium Album, or white-throat, to distinguish me from my brother Lamiums.

"You must often have seen Mr. Red Dead-nettle, my favourite brother, growing on the borders of meadow lands or hedge sides, his reddish blossoms

scarcely brighter than his purple red leaves. He looks very smart in comparison with his half-brother, who is called the Intermediate Red Dead-nettle. He is a very dull-looking fellow, with purplish-coloured flowers, and stands about a foot high. Indeed, I always think Dame Nature must have meant him to be twins with the cut-leaved Dead-nettle, who owes his name to the deeply cut teeth in his leaf edges, and who puts forth his dingy, purple blossoms from March till June.

"But the beauty of the Lamium family—apart from myself of course—I consider, is my little sister, the Hen-bit-nettle, for her blossoms of fine, deep reddish purple on very long tubes, are of a much richer tint than any other coloured member of the family. Even her leaves and stem are of a deep, rich, green hue, instead of being dull coloured like those of most of her relations.

"And now, by the way, I may as well mention, that if you object to my name of Dead-nettle, you may call me the White Archangel if you will, for I am very commonly known by that, just as my brother, the Red Dead-nettle, is called the Red Archangel, and one cousin, the Yellow Weasel Snout, is called the Yellow Archangel. Well, why do you look surprised, what is the matter?"

"Oh! nothing's the matter," said Rhoda; "only I think we will call you Mr. Dead-nettle, if you please. I daresay the white wings of your blossom made people think of angels, but you see you *are* only a nettle, and one never has thoughts of angels and nettles together. Then too, you know, it would sound rather awkward to say 'Mr. Archangel.'"

"Oh! you can please yourself," said the White Archangel; "Mr. Dead-nettle will do very well, I'm sure. Only if you've never heard people compare flowers to angels on earth, I'm sorry for you. Now I'm tired, and I shan't teach you any more to-day," and without adding so much as a "good-day," Mr. Lamium Album, otherwise known as Mr. White Dead-nettle, dismissed his pupils.

"I think," whispered Hugh to Rhoda, "though his leaves mayn't sting, he must have a little of the nettle somewhere in his nature."

Part II.

"Certainly, there are very silly folks in the world," was the opening remark with which Mr. Dead-nettle began his next day's lesson; "for, would you believe it,

there are actually some people to be found who can't tell the difference between me and the sting-nettle, and are afraid in consequence to come near me. My leaves, of which we will speak later, are certainly very like those of the nettle, but if people would only take the trouble to look at my square stem that alone is quite enough to distinguish me from my namesake of ill-repute.

"My stem grows generally about a foot high, and is hairy. Some country boys, who have the sense to understand my good-natured disposition, make whistles out of my four-sided stalks. As I said just now, my heart-shaped leaves tapering to a point and their deeply toothed edges are remarkably like those of the sting-nettle, and like his afford a very good example of a dicotyledonous leaf, for nowhere could a network of veins be more clearly marked.

"Though now-a-days I don't pretend to rank with the thyme, mint, and other pot-herbs, yet in olden times, when folks knew what was good for them, my leaves were gathered and boiled and eaten by frugal house-wives, who valued them highly as a spring vegetable.

"My leaf, you see, is furnished with a stemlet of its own, which, as perhaps you know, is called a foot-stalk,

and they are placed in pairs opposite to each other up my stem. But each pair of leaves, instead of pointing in the same direction as the pair above it, always points in an exactly opposite one. Thus, if the leaves of one pair point east and west, those of the next will point north and south.

"This arrangement of leaves is an important characteristic amongst the members of the *Labiatæ* tribe.

"The arrangement of my blossom is also remarkable. Do you see how they are all gathered in a cluster round my stem in what is called a *whorl?*"

"Because they are all whirling round?" asked Hugh.

"That's not a bad guess," said Mr. Dead-nettle, "for the two words had, I believe, the same grandfather, and they each mean something turning round. Only you see my blossoms sit still in a ring, they don't turn themselves about; and very snug and comfortable they look, seated in that sort of little hollow, with a pair of my pretty leaves enclosing and protecting them on either side."

"Then please, Mr. Dead-nettle," asked Rhoda, "do all you *lipped* flowers wear your blossoms in rings round your stem?"

"Oh dear no," was the answer. "Amongst the mint

family the hairy mint bears his lilac flowers in a whorl, and so does his brother the corn-mint and his cousin the penny-royal, though he is the smallest of the family, and, unlike them in most points, also wears his fragrant purple blossoms in rather far apart whorls; but the round-leaved mint and the horse-mint both carry their flowers at the top of their stem, crowded together in a spike. My aromatic cousin, Miss Marjoram, sets a different fashion again in the arrangement of *her* blossoms, for her heads of purple flowers take the form of a *cyme*.*

"But now it is time that I returned to my own blossoms. Look now at my green calyx, or flower-cup. It is bell-shaped and is notched into five tooth-shaped sepals, and, like my corolla, it is irregular, the sepals, as you can see for yourself, matching with each other neither in height nor size. If you look closely at my calyx you will see it is marked with ten little ribs, two of which seem to belong to each of the five teeth, or sharply pointed sepals.

"At its base it encloses the four-lobed seed-vessel, about which we shall speak later.

"The next step from my flower-cup is to my flower

* "In a cyme," said Lady Science's book, "the stalks are irregularly branched, but the flowers are nearly level, as you may see in the blossom of the elder."

itself, whose pure white blossoms must surely have suggested our name of archangel, from their resemblance to angels' wings.

"My corolla is called monopetalous, that is, consisting of one petal or piece divided into two parts, each of which are so like lips that they are commonly spoken of as the upper and lower lips of the flower. *My* upper lip, however, is so peculiarly arched that it is also called a helmet."

"Oh, yes," said Rhoda, "I've learnt a piece of poetry about the 'harmless nettle's helmed head.'"

"Very likely," said Mr. Dead-nettle. "Now you see my corolla is so arranged that our flowers look exactly as if they were standing with their mouths open waiting for a doctor to come and look down their throats, and this is why we earned our name of lamium or throat-flower, from the old Greeks. My upper lip or helmet, which ever you like to call it, is oblong in shape; my lower lip is notched into three oval-shaped teeth, whilst in the bottom of my throat, which ends in a tube curved upwards, is a drop of the sweetest honey, well known to bees and butterflies.

"So much then," wound up Mr. Dead-nettle, "for the outside of my blossom. Of its inside, with all its little staff of household officers, I will tell you to-morrow."

Part III.

"Now," began Mr. Dead-Nettle, on the following day, "if you look inside my upper lip you will see my four little black household slaves, the two front ones taller than the rest, and each having a tiny black bundle on his head. I suppose by this time you can guess what their business in life is?"

"Oh! yes," cried both children, "they are the stamens or dust-spikes, and those little black lumps on their heads are the anthers or pouches where your flower-dust is kept."

"Right," said Mr. Dead-Nettle; "those small black-a-mores are my stamens, and rising into the open part of my flower along with them, you will see my pistil with its long curling style and two-forked stigma. Now that two-forked stigma has a very frisky look, as you can see, and he is so fond of getting himself entangled amongst the stamens and leading them to join in a regular romp, that to tell you the truth, there would be very little work done between these gold-dust bearers and the frisky gold-dust carrier, if I hadn't hit upon two plans—school-boys would call them 'dodges'—for making sure of some pollen, at any rate, reaching my seed-vessel.

"One of these plans is, that for half the year my flower

stands with his mouth so wide open that every passing bee can discover the sweet honey drop inside my throat. And all bees being greedy fellows, of course they come bustling into my blossoms, and brush the gold-dust out of my anthers with their great downy bodies, without ever staying to ask the stigma if it is agreeable to him to be covered all over with this yellow powder.

"I know it is rude of these intruders to treat my household staff so roughly, but I never pity them, for as I tell them, it is a just reward for their idle gambols, and on the whole, as they are a lazy set, I suspect they like this plan for conveying the pollen to the seed-vessel better than my other one.

"The bee business is my summer dodge, this is my winter one.

"Now if you take the trouble to watch my blossoms, you may observe that, although I am supposed to be more or less in blossom all the year round, for six months, at any rate, out of the twelve, I keep my lips nearly half closed, so that my flower looks more like a little monk's cowl than a gaping mouth. The fact is, I treat my young work-people very much as schoolmasters treat their boys. In the bright, sunshiny weather, the doors and windows are flung open, and

young folks may go out to play; but when the summer holidays are over, the doors are close shut again, and the pupils must bend over their desks and books.

"Just so, when the summer days are done, I draw down my hood-like upper lip so tightly over my frisky-forked stigma, that I force him to go to work amongst my black-a-more stamens, and, at any rate, to take charge of a little of the gold-dust from the anthers. And so you see, between the unwitting work of the bee in the summer and the unwilling work of my little toilers in the winter, the pollen does get carried at last down the curling style to the base of the pistil, and given into the care of the two carpels of which my ovary or seed-vessel is composed.

"Each of these carpels or green seed-cases contains two large seeds apiece, and is divided in half by a tiny valve or partition, so as to give each of these infant seeds a separate little nursery all to itself.

"Some folk call these divisions of my four-celled ovary, *nuts*, but you wouldn't think them much like the hazel-nuts you gather in woods.

"And now, although Dame Nature allows our infant seeds to begin life so comfortably, each cosily tucked up in his own little cell, she doesn't mean to leave them there when they have once come to an age to fight their

own way in the world. As soon as they are ripe, they must be up and doing.

"Now there is a variety of ways in which she starts her baby seeds on their own path in life. Some, she merely shakes very gently out of their cradles on to the ground, others are jerked out quite rudely, others are given wings to fly with, or sails to sail with, others are *shot* out of their pods with a loud, sharp report as if Dame Nature had fired a pistol into their midst and sent them flying, others are carried by birds and dropped here and there, whilst some—and to this number my seeds belong—are allowed to fall on to the ground, carrying their seed-case or nursery along with them.

"And on the ground they lie, waiting patiently until the rain and dew have worn away the walls of their tiny house, by which time they will be of an age to begin life on their own account, and to make their own terms with Mother Earth, on whose lap they wake up to find themselves.

"And now," said Mr. Dead-nettle, "that is all I care to say about myself, but perhaps in justice to some of my relations, notably, all the mints, the lavender, marjoram, thyme, and others, whom I need not mention particularly, I ought to tell you that their stem, leaves, and blossoms possess one valuable quality, which

mine do not, namely, that rich aromatic or sweet smelling-oil, so valuable in medicine and flavouring of all kinds."

"I suppose the truth is, Mr. Dead-nettle," said Hugh, "that your plant is hardly steady enough to do anything very useful. You see, you said just now that your stigma is fonder of play than of work, and we learnt yesterday that your flowers were always in a *whorl*. I must say I do think now that it is very silly to call *you* Mr. Dead-nettle, for altogether you seem particularly lively."

"Well, I'm glad you've learnt so much about me, at any rate," said Mr. Dead-nettle; "but, remember, we don't play all the year round, and when in the long winter days you are shut indoors at your lessons, you may remember my little working-party shut up inside my hooded corolla, and think that they are brothers in misfortune with yourself. Now, good-bye, my dears, and give my compliments as you pass to all my relations in the garden to whom this lesson has introduced you."

"That we will," said Hugh, and off he ran to dispense Mr. Dead-nettle's greetings to his garden relatives, leaving Rhoda as usual to read Lady Science's notes alone.

The White Dead-nettle.

Class, Dicotyledon; *tribe*, Labiatæ or Lipped; *family name*, Lamium.

Stem, four-sided, hairy.

Leaves, heart-shaped, tapering to a point, with sharply-toothed edges.

Calyx, in one tubular piece, notched into five sepals, irregular.

Corolla, monopetalous or in one piece, two-lipped.

Stamens, four, enclosed in upper lip. Two front ones taller than the other two.

Pistil, composed of two carpels with one style and forked stigma.

Ovary, four-celled each cell containing one seed.

CHAPTER IX.

MISS SNOWDROP.

"Thou first-born of the year's delight."
—*Keble.*

"SO it's my turn to give a lesson to-day, is it," said the little Snowdrop. It was a bright morning in February, and her white bell, as it hung from its slender footstalk, glistened in the sunlight.

"Yes," answered Rhoda, "and your turn has seemed a long time coming; for we have had no one to teach us since Mr. Dead-nettle gave us his lesson last autumn. But you have woken up much sooner than the rest of your brothers and sisters," she added, for though probably the little woodland dell where the children were standing would be quite white in another week with these "fair maids of February," their solitary snowdrop was the only one visible at present.

"So much the better," was the reply, "for if you listen to what I tell you now, you'll know all about the rest of us, when they're ready to be seen. Now to begin with"—and Rhoda thought her little white teacher gave rather a haughty toss to her snowy bell, "I must, first of all, tell yon that *we* are not common wild flowers like daisies and buttercups and those kind of field-folk; properly speaking, we are garden flowers, and though we are often seen growing in lanes and in copses, it is because we have chosen to stray from our grander homes.

"And we're very well known all over the world, and have been nearly ever since the world began.

"Long, long ago, the little Greek children used to gather my ancestors, and I am still known to learned folks by the name they gave us then, Galanthus,* that is the milk flower, which shows, you see, how spotlessly white we have always been."

"Then," interupted Hugh, "is Galanthus your family name?"

"My full name," said the Snowdrop, "is Galanthus Nivalis, or Snowy; the latter word is added to distinguish me from the only relation I have of my own name, and of whom I know very little. She came

* From γάλα milk, and ἄνθος flower.

to England a few years back, brought from the Crimea, I believe, and she is kept in gardens as a sort of state-prisoner, poor creature! She has a grand name tacked on to her, which only means *folded*, however, because her leaves are plaited.

"The name of my tribe is the Amaryllis tribe. Some say we were so called after a beautiful young country girl, Amaryllis by name, whom some old Latin poet made verses about. I have very few relations here in Great Britain, belonging to my tribe, though I have numbers of very grand connections in foreign countries.

"Hereabouts you will only find my cousin, the Daffodil, and ——"

"Oh! I know," broke in Hugh,

> "Miss Daffy-down-dillie who came up to town,
> With a yellow petticoat and a green gown."

"And the Narcissus," went on Miss Galanthus, who apparently did not wish to hear any verses made on so near a relation, "and the Snowflake. This latter is a half-sister of my own, and a very lazy one too. She's never out and abroad until the May-bells have rung to wake her up. She's very different from *me*, whom people say am the bravest little flower of all the year. *She* could never earn the name by which we are known in France of 'Pierce the Snow.' Nor could she claim to be called the

Snow's little bell either, as my cousins German are named.

"But now to business: I wonder how much you remember of your last year's lessons, I wonder how much you could tell me about myself. I suppose, at any rate, you *can* see that I'm not like a primrose, eh?"

"Oh! yes," cried Rhoda, "the primrose is yellow, and looks up in one's face; you're very pale, and you hang your head down."

"Of course you can see all that," said the snowdrop, "but suppose you didn't see my flower or the primrose either, how could you tell at once by only looking at our different *leaves*, that we don't belong to the same class, even, into which you learned folk divide the kingdom of flowers?"

Rhoda looked at the straight bluish-green leaves for a moment, then she exclaimed:

"Oh! I know you've got nothing but straight lines in your leaves, and so you don't belong to the same class as the primrose, and all those other flowers whose leaves have a little net-work of veins running over them. They belong, I know, to the class of the Dicotyledons; we've met with so many, that we've learnt that great long word by heart now, but I can't remember what your class is called."

"Monocotyledon or *one* seed-leaved," said the Snowdrop. "Did you notice any other flowers in the fields last summer, who had straight-lined leaves like mine?"

"The Orchises," said Rhoda, "but they've not given us a lesson yet; are they related to you?"

"Dear me, no," said the Snowdrop, "they're merely acquaintances, who come into my class, being monocotyledons like myself. But if you went to their roots, you wouldn't think they were exactly relations of mine, they have such very funny ones. Now my root is as—"

"Oh! I know," said Hugh, "your root is a little brown bulb, I saw it being put in the ground in the Autumn. No, don't shake your head, Miss Snowdrop. I'm sure I'm right."

"And I'm quite sure you're wrong," said the little pale governess, "but wiser folk than you make that same mistake. Now listen. That little brown bulb, though it does grow underground, is my stem, and my *roots* are the tiny white threads which sprout out of the bulb and take hold of the earth.

"Each of these fibres or root-hairs, as they are called, has a little mouth which sucks up nourishment from the ground. Then comes my bulb, or underground stem, brown in colour, as you said just now, and consisting of a number of small flakes. These flakes fit closely over

each other like so many little overcoats, and to tell you the truth, that's just about what they really are. They are the warm outside coverings which Dame Nature wraps round and round her baby snowdrops.

"For if on an Autumn day you were to take one of our bulbs and cut it through, you would find the whole of a little snowdrop plant, stem, leaves and blossom, all lying snugly curled up inside its covering, waiting for the first sunbeam to put its head above ground. Thus they lie in bed, as you may say, very much as you yourself lie curled up in your little bed every morning waiting for nurse to call you. And just as you put first one foot out of bed, and then the other, and don't come tumbling out with your head foremost on to the floor, so we first send out our straight green leaves from our bulb, and afterwards our one long stalk. At the end of this stalk, carefully packed up in a kind of sheath, is our beautiful snowbell.

"This kind of sheath serves as a cloak, such as ladies wrap over their white ball-dresses you know, when they go out at night, and which we are very glad to wear at first, until we get used to the outer air. Then, by degrees, when we have warmed ourselves a little in the rare gleams of sunshine, we open our sheath on one side, and out we glide in all our snowy beauty, hanging

down from my stalk as you see me now, by a slender green thread which we call our foot-stalk. My sheath, you see, I have thrown back from my blossom, and it waves above me now like a tiny green pennon.

"But now, if you come back to-morrow, I will go on to tell you about the useful parts of my plant before saying more about the prettiest."

Part II.

"Well, to begin with my leaves," said Miss Snowdrop next day. "Do you know that if you looked through a microscope you would see their upper surface all full of little holes? and do you know what the use of those little holes is?"

"Of course we do," said Hugh, "they're the sort of mouths or traps by means of which the leaves draw in all the air and food materials to feed themselves and the rest of our plants on."

"Yes," said Rhoda, "and they're a kind of little breathing organs too, through which your plant can breathe."

"One at a time," said Miss Snowdrop; "don't both speak together. I daresay what you said was right, for

I couldn't hear plainly. So I'll tell you what you should have said. Every leaf is a breathing mouth of the plant to which it belongs, and is at the same time on such good terms with the air or atmosphere about it that, like a little merchant-man, it is always exchanging and bartering with the atmosphere for the special materials which are necessary for the food of the plant of which it is a part. Now we come to my stalk, which you see is thick and nearly as much inclined to be flat as round, and which is filled with a whitish juice. Now, I consider that my stalk is the connecting-link between the unseen part of my plant, that is the root and stem, and that which is most conspicuous, the blossom. But it is still more than that, for it has very important work to do. For my stalk acts the part of a parlour-maid to the one beautiful blossom which it bears. It brings it all the food it needs from the root and from the leaves, just as you know your parlour-maid brings you your meals from the kitchen.

"Now, if you were cruel enough to pinch my stalk very hard in one place, so as not actually to break it but rather to crush it, you would find my snowy bell next day hanging down and shrivelling as fast as possible for lack of the food that my poor crushed parlour-maid could no longer bring it. So you see how

useful my stalk is, and how much depends on it. And now, what is the next part of me to be considered?"

"Your calyx, I suppose," said Rhoda, "only I can't see that you've got one."

"No, because I suppose you're looking for a common green flower-cup, such as buttercups and those sort of folk have," said the Snowdrop; "but though my calyx is an uncommon one, I have one all the same. Wait a minute. By this time I suppose you've heard enough flowers pick themselves to pieces to know the proper name for the divisions in my bell?"

"Oh, yes," said Rhoda; "why they're called petals, of course, and I can see that you have six."

"Then you're wrong," said Miss Snowdrop, "for I just haven't six petals, though it is astonishing how many people are kind enough to say that I have.

"Once I actually heard one noodle say to another, 'The snowdrop, you see, has six petals, but no calyx at all.' Was there ever a grosser slander? For, to tell you the truth, my flower-cup is so exquisite and so exactly flower-like that boobies mistake it for our flower itself. It is just as if, if you had a jacket made of the same looking stuff as your frock, people were to say you had no jacket but only a frock with two bodices to it. Now those three perfectly white and curved

divisions, which you would call my three outside petals, are really and truly my flower-cup and are no more to be reckoned as petals than your jacket ought to be called a bit of your frock.

"Now the little Greek children, whom I told you played with my ancestors, must have been sharper-witted than you, for they would have told you that the proper name for *my* flower-cup is perianth.*

"This perianth is, as you can see, divided into three parts, and these three parts, like the divisions in common flower-cups, are called sepals.

"Now, when you meet with my golden-robed cousin, Miss Daffodil, or my sluggard half-sister the Snowflake, remember to look out for their perianth, and don't offend *them* by telling them they haven't got a flower-cup.

"And now comes the turn of my petals, which you understand now are only three in number, and marked in the middle with a little green V turned topsy-turvy.

"If you look into the inside of the little cup which they form, and which is so daintily lined with green, you will see six yellow threads springing up from the

* "Perianth," said Rhoda's book, "means something *surrounding* the flower, from the two Greek words 'peri,' about, and 'anthos,' a flower."

centre of my flower, with a seventh and taller thread in the midst of them. Now, can you tell me the names of these?"

"The six yellow threads are your stamens or dust-spikes," said Rhoda, "and the one in the middle is your pistil, and I can see it's forked at the top."

"Quite right," said Miss Snowdrop; "but should you say my stamens were forked?"

"Oh no," said Rhoda, with a laugh; "they have little narrow cases on their heads, which are the anthers or pouches to hold the flower-dust; and I suppose, Miss Snowdrop, that tiny green cushion at the bottom of your flower, which looks as if it had been made on purpose for your stamens and pistil to sit upon, is your ovary or seed-vessel."

"Well done, little woman," cried the Snowdrop. "I see you have paid great attention to all your teachers, and have learnt your lesson well. Yes, that green, hollow case is made on purpose to hold my seeds. Indeed, it acts as a sort of secret drawer, where all the gold dust of my flower is gradually stored away, and of which nobody takes any notice as long my flower is in bloom. It is only when my pretty petals are shrivelled and dead, that it is no longer overlooked, for then it swells gradually larger and larger, till

even the most careless observer must notice it. If you looked at this green case now, you would see it is shaped something like a bottle, wide at the base with a tube springing out from the centre. Now this tube, as no doubt you guess, is the style of my pistil, which ends, as we said, in a forked stigma. And it is this forked stigma which receives the pollen from the anthers, and conveys it by way of the style to the seed-vessel at its base. But I want to draw your attention to one fact about the arrangement of my stamens and pistil. In most flowers, where the pistil, or rather I should say the stigma of the pistil is longer than the stamens, the pollen is carried to the top of the stigma by the help of bees. Now my stigma is longer than my stamens as you said just now, and yet no bees come to help me in my seed manufacture. Why is it, do you think, that I can get on quite well without anyone to help me?"

"I can't guess," said Rhoda, looking very puzzled.

"Well, come, think a little," said the Snowdrop; "see how my blossom hangs down from its footstalk. The tops of my petals point downwards, the forked stigma points downwards, and so do the anthers on the end of my stamens."

"Oh! I see," said Rhoda; "of course, when the

anthers burst, the pollen falls actually downwards on to the stigma, and of course it would never do in *your* flower to have the stigma shorter than the stamens, for all the pollen would fall on the ground then and be wasted."

"Of course," said Miss Snowdrop, "you can see this same arrangement in the Fuchsia and many other flowers besides, who droop their heads. Well, from the moment my seed-vessel has received the flower-dust from my stigma, it begins to swell till at last it reaches almost the size of a small green gooseberry. This is my capsule, and if you were to open it you would find it divided into three divisions or cells, and each of these cells you would find crowded with baby seeds. For *I* can't afford to give separate nurseries to my infants, as Mr. Dead-nettle and others do. In due time the capsule will open of its own accord, and the seeds will fall to the ground, each having, as you know, a baby snowdrop plant wrapt up within it, which will presently begin life on its own account, and some day develop into another such plant as the parent snowdrop from which it came.

"And now I have finished my story; and I hope when the rest of my brothers and sisters are all in flower, you will feel as much at home with them as if they were old friends of yours."

"Oh, yes," said Rhoda, "we shall come and see them, and tell them how much you have taught us about them. Thank you, Miss Snowdrop, and good morning. I am afraid you must find it very cold, standing there in one place all day long. I wish you could take a run to warm yourself like we do."

Extract from Lady Science's Book. The Snowdrop.

Class, Monocotyledon; *tribe*, Amaryllis; *family name*, Galanthus Nivalis.

Stem, underground, bulbous.

Stalk, an erect scape.

Leaves, parallel-veined, smooth and channelled.

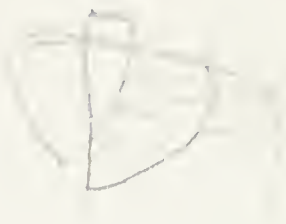
Calyx, properly called perianth, flower-like, divided into three sepals.

Corolla, divided into three petals, each notched in centre.

Stamens, six, seated upon receptacle.

Pistil, single, with forked stigma, and three-celled ovary.

Fruit, borne in capsule, seeds numerous.



CHAPTER X.

MISS PRIMROSE.

"Pale primroses puritan, in maiden sisterhoods demure."
—*Lord Lytton.*

THEY were certainly a very meek, demure-looking sisterhood, that group of primroses, who lifted their calm, moonlight-coloured faces to meet Rhoda's view, and seemed half-startled when she asked if they were ready to give her and Hugh a lesson.

"Sleepy things," said Hugh; "they don't look half awake yet, I should just like to give a tweak to one of their crumpled leaves."

"Oh, don't Hugh," whispered Rhoda; and she was glad he did not fulfil his threat, for presently one of the gentle party spoke, and her voice was so sweet that Rhoda's heart was won at once.

"I'm afraid," said little Miss Primrose, "that we're the

most unpunctual of all the arrivals in spring, but we are so completely at the mercy of the cold winds, and you see we've not got nice wraps like Miss Galanthus to put all over our head and face, and only slip off when we've grown used to the chill outer air. But there, as it is I'm afraid we've kept you waiting so long, that I had better begin the lesson at once. Or, perhaps you'll tell me what it is you particularly want to know about us," added Miss Primrose, who was evidently very humble, and only anxious to give satisfaction.

"Well," said Hugh, "of course we want to know your tribe and your family name, and how many brothers and sisters you have got."

"If you please," added Rhoda.

"The name of my tribe," said the little meek governess, "is the Primulaceæ, so called from a Latin word meaning first, because we are reckoned the first flowers of spring. We Primroses, or first roses, take the first syllable of our tribe name, you see, for the half of our family name, which makes it all the easier for you to remember. Indeed, learned people who only talk of us by our Latin name, actually call us Primulas, but I don't like their doing so for this reason, that they then tack on the Latin word *vulgaris*,

or *common*, to my name, to distinguish me from the other field Primulas, who are my brothers and sisters."

"Then you have got brothers and sisters?" said Hugh.

"I should think so," was the reply. "Why, there's my brother the oxlip, he has smaller flowers than mine, and lets them hang about together in clusters like a parcel of idletons; and then there's the cowslip, also a brother of mine, and who, in his turn, has still smaller flowers than the oxlip, and still larger knots of those lazy-bones, who, like the blossoms of the oxlip, are all dependent on the one parent stem for their support. There is a strong family likeness between all us three, for we have all yellow faces, round flower-cups and crumpled leaves; but you might not think, at first sight, that our little sister, the bird's-eye primula, belonged to our family.

"And yet she does, and we're very proud of her, for she is a lovely little flower, with her purple corolla and yellow eye, and her leaves so thickly covered with a powdery meal, that she is known to learned folks as the 'primula farinosa,' or 'the floury primrose.' Then, too, we have a sister in Scotland, who is said to be more beautiful than ourselves, which may or may

not be the case," added Miss Primrose. "Not having been in Scotland myself, I have never made her acquaintance.

"Well, those are the members of my own immediate family, the primulas proper, and though later I shall have a few words to say about my garden relations, my tribe does not include many other field flowers of note. There is, to be sure, the family of loose strifes, and the chickweed winter green, and the sea milkwort, and the water violet, as well as the cyclamen, or sow-bread, as it is commonly called. Nor must I forget to mention my favourite small cousin, the darling, in fact, of our tribe, the little pimpernel, with her bright scarlet flowers—'the poor man's weather glass'—and her little sister, the bog-pimpernel, whose upright rose-coloured blossoms some people think even prettier than the scarlet ones of the little weather glass.

"And now for my garden relations.

"Everyone knows my second cousins, the velvety polyanthus, with his brown petals and bright yellow eye, and the pretty, powdery auricula, and the delicate lilac Dutch primrose, and the handsome purple China primrose, and all the double primulas of green-house growth. All of these bear an evident family likeness to myself, but perhaps you will be surprised to hear

that the elegant pink and white cyclamen, who owes her name to her twisted spiral stalk, is also a relation of mine. And yet, if you stop to examine her a little, you will see that she, too, has all the leading characteristics of our tribe; the calyx or flower-cup in five divisions, the five-lobed corolla, and the five stamens or dust spikes. But about all these you shall hear to-morrow. To-day you have learnt the name of my tribe and my family, and what those names mean. You can tell me that, can't you," added Miss Primrose, looking at Rhoda, "as well as the class to which I belong?"

"Oh, yes, yes, we both know," interrupted Hugh; "you belong to the tribe of the 'first flowers,' and the family of the 'first roses'; and as to your class, why, of course, you belong to that great big class which holds every flower under the sun, except the snowdrop and the——"

"No, no, don't be in such a hurry," remonstrated Miss Primrose. "First of all you should call the class by its right name, which is Dicotyledonous, and then, besides the snowdrop, there——"

But by this time naughty Hugh was running away down the lane, dragging Rhoda after him at such a rate, that she had hardly breath enough to pant out,

"Oh! Hugh, how rude of you to run away like that from the poor little Primrose, and whilst she was still talking too."

Part II.

"Now you needn't trouble yourself, Miss Primrose, to tell us anything about your roots," said Hugh, next morning, "for I've dug up such hundreds and thousands of them."

"Oh! Hugh, only about five," interposed Rhoda.

"Such hundreds and thousands," repeated Hugh, "to plant in my own garden, that I know exactly what your root is like. You've got a little scaly, pinkish, brownish sort of underground stem, with ever so many threads or root hairs hanging down from it, and still smaller threads growing out from them. And you've got no regular stem above ground, only your pale pink downy stalks, and as they have only one flower, and no leaves on them, and spring directly from the root, they are called—oh! Rhoda, what was it that Mr. Dandelion taught us long ago that they were called? I do forget that part," added Master Hugh, who had been rattling on at such a rate that it was not until he did

bring himself to this sudden stop that his meek pale-faced little governess ventured to lift up her voice.

Then she said, with more spirit than usual, "You've described my root in such a rough and ready style, young sir, that I advise you the next time that you are digging up hundreds and thousands of us, to stop a few minutes and look at us carefully. About my flower-stalks, however, you are right enough; they do spring from the root and bear only one blossom, and so are called *scapes*. You must have met with many scapes before in the flowers of other tribes."

"Oh! yes," said Rhoda, "and we've learnt what it means. It's from a Greek word, don't you remember, Hugh? meaning something that supports something else."

"Just so," said Miss Primrose; "and now you'll observe that my *leaves* also spring directly from the root and have no leaf-stalks of their own. See how curiously my leaf is fashioned. It has one principal rib, like a backbone running down the middle with little white ribs, as it were, branching out on each side, and these are connected by such a number of tiny veins that they give the upper part of my leaf quite a wrinkled look. Now we come to my calyx, which, as you see, is a deep close hairy green cap, made all in one

piece, with five divisions which taper off into five thin spikes, it grows upon the top of the stalk, and encloses the corolla or coloured part of me. Now, I daresay at first sight you would say that my corolla was made up of five petals, so you will be surprised to hear that I and my family are constantly held up as affording examples of monopetalous or one petalled flowers, because our corolla, like our flower-cup, is also all in one piece.

"For if you stripped off its green covering from my flower, and looked at it then, you would see that it is made up of one single petal which is shaped like a funnel, that is with a long narrow tube or neck. This fits into the calyx *below*, and spreads out into a wide, deeply-notched salver *above*. I really think that Dame Nature must have been playing at a sort of 'Fives game,' perhaps not exactly the fives game you play at," added the Primrose, looking at Hugh, "when she was planning my blossoms, for she never seems to have missed an opportunity of introducing the number five about us.

"Even the inside of our corolla she has ornamented with five little deep yellow spots, which correspond with each of the five notches, and which form a tiny golden coronet in the centre of my flower. Some people say it is a golden necklet round my throat.

"And now, before going further, I will tell you a curious fact about us primroses. In the matter of furnishing the inside of our blossom, Dame Nature has seen fit to make a variety amongst us. For in one half of us the arrangement of our central organ is quite different from that of the other half of us.

"We all have five stamens and one pistil, with a round green germ or seed-vessel at its base, a thin style and a round stigma at the top, just like the head of a pin.

"In all of us, likewise, there is a nectary full of honey at the very bottom of our corolla tube (this latter fact is well-known to those thievish little black flies, that you must have often seen inside our narrow throats, if you ever picked one of us to pieces).

"But whereas in one half of us the stamens or dust spikes are placed deep down in the throat of our corolla, so that their anthers or pollen pouches reach only half way up the long slender style, in the other half of us the stamens are fastened so much higher up in the tube, that the style, with its pinhead stigma, is ever so far below them. These last are known to wise folk as the 'short-styled primroses,' the former ones are the 'long-styled primroses.'

"As I and all this tuft of my sisters belong to the

short-styled party, it is about them that I am going to teach you to-day. But one thing you must remember, namely, that we two sorts of primroses keep entirely to ourselves, and never have anything to do with the opposite party, so that you will never find long-styled and short-styled primroses growing together on the same plant.

"Now, look at my stamens. They stand in the centre of my flower, so closely crowded together that their dust pouches seem almost to overlap one another, and it is quite impossible to gain the smallest peephole through the middle of them, so as to catch even a distant view of the pistil left so far behind in the throat of my corolla."

"But there's one thing certain," remarked Rhoda, "your stamens being so much taller than the pistil, it must be very easy work for your anthers to scatter their flower dust on the stigma below them."

"So it may seem at first sight," answered Miss Primrose, "but now if you look carefully at the centre of my blossom, you will see that immediately below the place where my stamens are fastened, the throat of my corolla grows so narrow and the opening seems so blocked up by the five anthers, that one wonders how the pollen can find any passage room to the stigma below."

"Still, all the same," said Rhoda, "I suppose that a *little* does fall through."

"Well, yes, a little does," answered Miss Primrose, "but it is so little that I don't think I and my sisters would do much in the way of coining the gold dust into seed, if it were not for the help of a certain friend of ours, about whom I will tell you to-morrow."

Part III.

"Is he a flower, too, that friend of yours about whom you are going to tell us to-day?" asked Rhoda, as she bade Miss Primrose "good morning" next day.

"No, he is that two-winged, brown-bodied thing, that *you* call a bee," was the answer. He is, of course, in the regular service of the long-styled branch of our family, but he looks in upon us occasionally after he has finished his day's work amongst the other primroses, and has covered the tip of that long trunk of his with a cloud of flower dust from their anthers. 'Now, my good Miss Primrose,' he will say, 'just give me a drop of that honey at the bottom of your throat,' and before I have time to say 'yea or nay,' he pokes his brown head into the centre of my blossom, and helps himself to what he wants. I'm too wise to complain of

his ungentlemanly manners, because if he takes my honey, he pays a good price for it, for before he has reached the drop of nectar in the throat of my corolla, the gold dust already collected on his trunk falls off his proboscis on to my round-headed stigma, so he pays ready money you see for what he takes. And we're glad to make use of the pollen which he brings from the long-styled primroses to help us in the manufacture of our own seed, though, for all that, we never grow a bit more intimate with the members of the other side of our house. And because we depend upon the assistance of bees in the perfecting of our seeds, we are said to belong to the number of what are called the *insect fertilized* plants, which, as perhaps you have already learnt, means plants that are made fertile or fruitful by the help of insects."

"Yes," said Rhoda, "we know that; we have met with other flowers who have told us how the bees help them."

"I daresay; but it hasn't hurt you to hear about it once again," said Miss Primrose. "And now, if you are not so taken up by all the new comers of spring as to have neither time nor thoughts for old friends, I would advise you to come here a few weeks hence and look at the work which our stigma and ovary, aided by

the obliging brown bees, will have done between them. Instead of our pale faces, and instead of the golden necklet at our throat, you will find at the top of each of our scapes or stalks a one-celled pod formed of five carpels or green seed-cases, each carpel opening at the top by a little valve or door; and in each of these little pods there are more seeds than you would have the patience to count."

"Is that why they want five doors to go through when they are ready to start out into the world?" asked Rhoda.

"Well, I daresay as there is such a crowd of them, that it is more convenient," answered Miss Primrose, "but I suspect the five carpels are made that number to match all the other fives in our flower—the five-cleft calyx remember, the five lobed corolla, the five jewelled necklet, and the five stamens. And now, recollect that learned folk would tell you that our fruit is called *dehiscent*, which means to say that our seed-vessels open asunder or gape when the fruit within them is ripe enough to take care of itself, as you will see that our carpels will do. They will split themselves open half-way down from the top, and the seeds within them will all go their several ways through the five little doors of which we have spoken.

"All that I have told you about myself is also so true of the oxlips and cowslips that I hope you will go and make acquaintance with them, for after all I have just been telling you, you ought to feel quite at home with them."

"Oh, we will go and call on them, I promise you, Miss Primrose," said Rhoda, whilst Hugh took off his hat to the little pale governess and all her demure sisterhood and thanked her like a gentleman for the lesson, which had been an extra nice one, because it had been "so jolly short."

"I'm sure we needn't bother ourselves to read over anything about her in that book of yours," said Hugh, "for I'm certain I shall remember all she told me."

"Yet still," answered Rhoda, "I think I would rather just read over Lady Science's notes;" and whilst Hugh ran on whistling in front of her, his wiser sister paused to turn over the pages of that tiny roll, which for all that it was so small, held so much information.

And those of my little readers who choose can look over Rhoda's shoulder and read what she was reading.

Primrose.

Class, Dicotyledonous; *tribe*, Primulaceæ; *family*, Primula.

Leaves, downy, with curious net-work of veins, springing direct from root.

Stem, absent; flowers borne on *scapes*.

Calyx, on top of scape, in one piece, five cleft.

Corolla, made of one single petal notched into five lobes, joined into a tube more than half-way.

Stamens, five, separate from each other, fastened to the tube of corolla.

Pistil, one with round germ or seed-vessel at base; slender style and round stigma, like head of pin.

Fruit, contained in one-celled pod, composed of five carpels, opening by five valves from the top; seeds numerous.

CHAPTER XI.

MISS VIOLET.

"Under the green hedges after the snow,
There do the dear little Violets grow."

—*Moultrie.*

"I TELL you, Rhoda, either I'll be taught by a white violet, or I won't have any lesson at all," announced Master Hugh, who on a certain April day had woken up in what his nurse called a very *contrary* mood.

Rhoda had just come running to tell him that she had at last found one lovely, dark blue violet, half hidden amongst her own leaves, seated on the orchard bank, and that the fragrant little blossom had offered to give them a lecture.

"I hate *blue* violets, they're common things," went on Hugh; "white ones are ever so much better, and I shall just go and look for one, though you can

do as you like." And so saying, Master Hugh ran off, knowing quite well that Rhoda would follow him.

But after all, though they spent much of their half-holiday in hunting for Hugh's special white violet, they came home in the end without having found one, and Hugh could but console himself by reflecting that perhaps "Rhoda's stupid blue thing" could tell him where to meet with a white violet.

"Oh! yes, I daresay she will," said Rhoda, who was so pleased to be starting for her lesson at last, that she was ready to "daresay" anything. "Hugh, you will be civil to my little blue violet," she added hastily, as they reached the corner of the orchard, where shewing shyly amongst her dark, green leaves, this pet child of Spring hung her purple head.

The tiny blossom spread such a fragrance around her, that even Hugh's temper seemed sweetened by it, and he said, "good morning" quite pleasantly, though he began at once, "Please can you tell me where I can find a violet with a white face. I was hunting all over the downs yesterday, and couldn't see one."

"I should think not," answered the Violet, "for you looked in the wrong place. My white-faced sisters

and I are no more natives of the same soil, than you and black men are natives of the same country. We do sometimes grow close together, just as white men and black men can live in the same place; but whereas I and all my purple sisters love a chalk soil, the white violets prefer to make their home in the clay."

"Oh! how funny," said Hugh, "then are you blue and white violets friendly to each other, or does one lot oppress the other, like we white men used to make slaves of the black?"

"Oh! don't ask such silly questions, Hugh," said Rhoda. "Please let's begin our lesson, Miss Violet, for I'm so afraid it's going to rain," and she glanced up at a grey cloud overhead.

"Well," said the Violet, "I'm quite ready to begin, but I daresay you mayn't think there is much to learn about my tribe, at least, not so much as about many others. For it is not of much importance, at any rate, not in this country, though abroad the members of my tribe are very highly thought of, not merely in the flower world, but in the kingdom of shrubs and bushes.

"But you won't have much trouble in remembering my name. Our tribe is the tribe of the Violaceæ, the same name as the old Romans gave us years ago, oh! so

long ago, that now no one can remember whether our blossoms were named after the colour violet, or the colour so named after our blossoms.

"And our family name *Viola*, you see, is only a big slice cut off from our tribe name. If you went to America, and those foreign parts, you would meet, as I hinted just now, with some of the most important members of my tribe; but although here in England we are great favourites with the gardeners, we have comparatively, very few relations amongst the field flowers. Indeed, I may say, I have no relations beyond the six members of the Viola family, whom I shall mention to you now.

"First of all, then, there is my brother, Mr. Viola Canina, or Dog Violet, the handsomest member of our family, as far as the size of his black-streaked, greyish blossom is concerned; then there is the 'Viola Hirta,' or 'Hairy Violet,' so called from the rough hairs which beset his leaf, stalks, and leaves. Then there is my pale-faced little sister, the Viola Palustris, or Marsh Violet, whose light, grey, lilac blossoms love to nestle amongst the mosses in bogs and marshes. Also a lover of moist, boggy heather is the Viola Lactea, or cream-coloured violet, so named from her delicate, creamy tints.

"But the next two members of my family, though they are Violas, are cousins of mine, I consider, rather than brothers. One is the Viola Tricolor, or the Heartsease, of whom there are many very handsome garden varieties, and the Viola Lutea, or Yellow Mountain Heartsease, though in spite of his name, his petals are often of a dark purple.

"I don't suppose any flower ever had more pet names bestowed on it than my cousin the Heartsease. 'Pansy,' 'Kit-run-the-street,' 'Love in idleness,' 'Three faces under one hood,' 'The whiskered pussy,' are only some of the scores of names that have been lavished upon him.

"But," broke off Miss Viola, suddenly, "here comes a drop of rain, which feels to me as if it were falling in a hurry, to give notice of many more that are going to follow, so now I will only add that *I* am called the 'Viola Odorata,' or Sweet Violet, and then I will recommend you to run home."

And with these words Miss Viola dropped her purple head still lower amongst her green leaves, and her pupils taking her advice ran homewards as fast as if they were running a regular race with the on-coming rain-drops.

Part II.

"Now, what do you suppose, my dears, would happen to you, if you set to work to eat my roots?" asked Miss Violet, next morning.

"I'm sure I don't know," said Hugh; "but I wasn't thinking of trying."

"Well, in case you ever should be tempted to try, I'll tell you," said the Violet. "My roots would probably make you as sick as any dose of that yellow-looking wine, which your Doctor gave you when you had the whooping cough."

"I know," said Rhoda, "it was called, Ipy-Ipy, something."

"Ipecacuanha," was the answer; "and you have to thank a cousin of mine, the Brazilian violet, for that, for it is from her root that the Ipecacuanha powder is made, which doctors put into wine, and lozenges, and half-a-dozen other mixtures. Her root is worth describing to you. It is what is called an annulated or be-ringed root, that is, if you dug it up, it would look to you exactly as if a lot of little earth-men or their wives had been hard at work, stringing their rings on the stem, just as you would thread beads on a bit of wire or silk."

"How funny it must look," said Rhoda. "I wish

your roots were like that. Is there nothing remarkable about yours, Miss Viola?"

"Nothing that I need trouble such little heads as yours about," said the Violet, "except in one particular, which is, that I am said to have 'creeping scions.' Now I think amongst you humans, *scion* means a son, amongst us plants, it means an off-shoot. And my creeping scions are twigs branching out from my root, which creep along underground for a very little way, and then throw up a fresh plant at a short distance from the parent one.

"And now, I wonder if you see anything remarkable about my flower-stalks?"

"Yes," said Rhoda, after looking at them carefully for a moment; "they have all got a little pair of tiny wings, like a baby fairy's wings, rather more than halfway up their stalk. We've never noticed such wings in any other flower before, have we Hugh?"

"No, I don't suppose you have," said Miss Violet; "well, now these winglets are called, not leaves, but bracts. You've heard of bracts before?"

"Oh, yes," cried the children, "a bract is a scale or sort of leaflet. Mr. Foxglove had bracts to take care of his baby bells, and Miss Daisy and Master Dandelion

had their flower-cups—at least, most of it—made up of bracts."

"Well now," said the Violet, "in our family great attention is paid to the shape of these bracts, and to their position on the stalks, because their shape and position furnish some of the most useful helps in distinguishing the various members of my family. My brother, the hairy violet for instance, who, in some respects resembles me more closely than any other of my tribe, wears *his* bracts as much below the middle of his flower-stalk as I wear mine above. And, whereas our winglets are too small and slight to have any marked shape, those of the dog-violet are larger and awl-shaped, that is, broad at the base, and tapering to a point. His stem, also, by the way, is channelled and leafy, quite unlike ours."

"But, please, Miss Violet," said Rhoda, "when you say ours, who do you mean besides yourself?"

"My brother, the hairy violet," was the reply, "and my little pale sister the marsh violet. These, like myself, have no real stem, but our leaves and flower-stalks spring directly from the root. Now look at my dark green leaves for a moment. They are heart-shaped, and slightly downy beneath, and one glance at their netted veins will tell you that they

belong to the class of the Dicotyledons or two-lobed seeds. As a family, we violas, are on remarkably good terms with our leaves. We don't lift our blossoms so high above them, that they are left like poor slaves crouching at our feet. Neither do we drag them along up our stalks, forcing them to follow in our train at a respectful distance behind our flower.

"We just grow all amongst each other, flowers and leaves alike, just like a united family, and the result is, that everyone says that a tuft of purple violets and their leaves is a beautiful bit of colour, for nothing sets off our amethyst tints like the green of our leaves."

"Yes, I'm sure that's true," said Rhoda. "I suppose now, Miss Violet, you're going to tell us about your flower-cup, or flower-cap as I should call it, for it looks just as if you had stuck it on the top of your blossom, like those fly-away sort of caps, that my doll who was dressed up like a peasant had stuck on the top of her head."

Miss Violet laughed. "It may seem fixed very slightly to you, because it is only fastened to my receptacle in the middle with both ends left free, and certainly it does not embrace my corolla so closely

and entirely as the calyx of the primrose does for instance, and yet for all that I can assure you that it manages to keep a very firm hold on my purple petals with its five little leafy fingers. For as you see, my calyx is composed of five sepals, which, like those of the hairy and marsh violets, are called *obtuse*, that is, blunted; whereas, those of the dog violet are acute, or sharply pointed. And being only attached in the middle, our sepals seem to lengthen out as it were, and form a little kind of frill round the top of the stalk."

"Oh, they looked to me," said Hugh, "much more as if they were all kicking up their heels at the stalk, like donkeys kick out behind, you know."

"No, I *don't* know," said Miss Violet rather indignantly, "for I'm not acquainted with donkeys; but as I don't want to hear any more rude remarks about my faithful calyx, we'll say good-bye to each other now, and to-morrow, if you please, we will go on with my corolla."

Part III.

"Now my corolla," continued Miss Violet, next day, "consists of five petals, which are very curiously

arranged. The two upper ones stand upright, as if they were the parents of this little petal family; then come two smaller ones, which stand opposite each other. These two lesser petals are called *lateral* from the Latin word for side, because they form the sides of the flower. These lateral petals have a hairy central line on their inside, forming a little downy fringe in their middle, and which not only looks very pretty, but serves as a kind of protection to the stamens in the centre of the flower.

"And now we come to the fifth and last petal, the lowest one of all. It is fashioned in front into a large full lip, and is lengthened out behind into a hollow tube, known to wise folk under the name of *spur*. This curious spur or heel is fastened to the calyx, and serves as the nectary or honey store-house where the nectar is kept, whose peculiar fragrance has won for us our name of sweet-scented violet.

"So you see, like my neighbour, Miss Primrose, I am also made up of five parts; and though my divisions are said to be very irregular, yet I think the arrangement of my blossom is quite as beautiful as that of the primrose.

"Like her, too, the number of my stamens is five. These, being slightly joined to each other, meet all

together in a point round my one little odd-shaped pistil. They are of a pale sulphur colour with bright orange tips. You have not met with these orange tips in any other stamen before, and they're not of much importance; for they are like a certain class of folk, who are always ready to take the foremost places and attract the most attention as long as there is no real work to be done, but who disappear very quickly from our midst when there is any chance of downright labour. So it is with those orange tips. They attract the eye of the ordinary observer who, not looking beyond them, fails to see the anthers or pollen-pouches on their short filaments or threads, which come just below these orange crests.

"When the time comes, however, for these little anthers to turn round and do their share of work, these showy orange-men have slid down from their exalted position and dropped quietly out of sight, for they are only scales after all, that dry up and peel off.

"Now if you look at my stamens, you will see that the upper three are alike, whilst the two lower ones are furnished with little spurs, which are enclosed in the greater spur of the bottom petal of the corolla.

"This arrangement helps to keep the different parts

of my flower in place. It is as if the party of home workers sent out these two little heart-strings to act as connecting links between themselves and the most distant of their petals, or as a bond, as it were, between a mother country and an out-lying colony.

"And now we have reached my pistil, which is made up of its three distinct parts, the ovary or seed-vessel, the style or tube, and the stigma or point of the pistil.

"Now *my* pistil," went on Miss Violet, "is very oddly shaped. The ovary at the base is round, and consists of one cell, with three valves or divisions in it. The style is very thin, and instead of being an upright little column like the styles of most pistils, mine is bent, and ends in a very queer shaped stigma. It is called by learned folk an *oblique* or awry-hooded stigma—a stigma that is with its hood worn crooked—but it looks uncommonly like a tiny unfledged bird.

You can easily guess, no doubt, how when the time has come for my anthers to scatter their precious flower-dust, the stigma and style will set about conveying the pollen to the ovary, where it will in due time be turned into seed, but I suspect you could not guess the plan we violets adopt for scattering abroad our seed.

"For you must know, that as a tribe we are noted for the talent we possess of throwing our seeds to a distance, and this is how we manage it:

"First of all, then, when our capsule or little chest—as the seed-vessel containing our fruit is called—is ripening, it changes its position, and instead of hanging downwards from the top of the stalk, as we violets when in bloom hang our modest heads, our capsule inclines upwards, so that when the time has come for our seeds to be dispersed abroad, you will find that my stalk has left off stooping, and drawn itself up so as to bring my capsule into a regularly upright position.

"As I told you just now, the capsule consists of one cell, with three slender valves or partitions in it. To each valve a row of seeds is fastened.

"By-and-by, as the sun's heat acts upon the parchment-like covering of my capsule, the covering will split, and you may perhaps see for yourself my closely arranged rows of glossy seeds sitting side by side like school children on a form.

"But the time will come when those demure little seeds will be overtaken by a severe shock. For as by degrees the thin green skin which acted as an outer covering to my capsule is shrivelled up by the sun, the

sharp edge of each valve or division is left to press itself upon the polished oval seeds, who have no longer any kindly lining to take off a little of the pressure. And so it comes to pass, that owing to this cruel pressure, the links which bind these infant seeds to their sheltering cells are not *gently* loosened, but on the contrary, are so rudely snapped, that all at once my baby seeds find themselves jerked out from their cradle-beds and shot abroad into the wide world to tumble as best they can, on their heads or their heels into the lap of our great Mother Earth.

"And of this peculiarity of shooting out our seeds, we as a tribe are very proud."

"But it must be rather a shock to your poor little seeds," said Rhoda, "when they are sitting so demurely in a row, to be shot out so suddenly. Perhaps that is what makes them hang their heads for the rest of their lives, because after such a shock they can't hold up their heads again."

"Shock! stuff and nonsense," said the Violet; "we hang our heads because the experience of our youth has taught us the value of humility, and so we don't begin life like some folk, with pride, and end with a fall. 'Twouldn't be a bad thing if the rest of the world followed our example."

"But I'm rather glad we're not obliged to do so," whispered Rhoda to Hugh; though aloud, she only said, "Thank you very much, Miss Viola Odorata, for your kind lesson, and I think you've got the sweetest scent and the flightiest flower-cup, and the funniest way of scattering your seeds that we have ever seen in any flower before. But I'm glad to find you're such a near relation to the heartsease, because I shall often think of you now when I see him in the garden, and he will remind me of all you have told us about the Viola family."

And therewith Rhoda and Hugh took their leave, Rhoda turning, as I invite you to do now, my readers, to the last page but one in Lady Science's little roll.

VIOLET.

Class, Dicotyledon; *tribe*, Violaceæ; *family name*, Viola Odorata.

Root, perennial, with creeping scions.

Stem, absent; *stalk*, springing from root, winged with bracts.

Leaves, heart-shaped, springing from root.

Calyx, in five sepals, obtuse, separate, attached in middle only to corolla.

Corolla, in five petals, lower one ending in spur.

Stamens, five, united slightly to each other; *anthers*, lengthened into flat membrane.

Pistil, one with bent style and oblique, hooded stigma.

Ovary, one cell, seeds numerous.

CHAPTER XII.

MR. EARLY PURPLE ORCHIS.

"The Orchis race with varied beauty charm
And mock the exploring bee or fly's ærial form."
—*C. Smith.*

"OH dear, we have only one more lesson to take," said Rhoda, one morning early in May, "for this is the last chapter left in Lady Science's Guide Book, for you see she and Dame Nature only arranged with members of twelve of her flower tribes to teach us, and the last of our lecturers is, I see, to be one of those strange-looking purple orchises. Don't you remember, Hugh, when we were paying a visit the other day amongst the cowslips and oxlips, we noticed a little plot of long, narrow pointed leaves springing up in the shape of a star from the ground, with a little bud in the middle of them, wrapt up in a thin silvery case? And don't you remember that the cowslip nodded his

golden head towards him and said, "There's one of our learned professors just beginning to wake up. He is a queer, eccentric fellow is the early purple orchis, but we field-folk think a good deal of him. He and his family are all so entirely unlike anybody else."

"Yes, yes, I know," said Hugh; "I'd like to have a lesson from him. Let's run and see if he's wide-awake enough to teach us yet."

So off ran the children to their favourite meadow. It looked a lovely picture now, all aglow with the fresh bright colours of the spring flowers. The butter-cups shone out amongst the grass with their burnished golden faces, and Hugh and Rhoda felt proud to think how much they knew about them this year. The daisy spread out her silver rays, the cowslips drooped their yellow clusters, whilst here and there the newly awakened blue-bells showed like bits of summer sky amongst the clouds of grass.

And amongst all that gay crowd the orchises lifted their round firm, stems and reared their handsome purple spikes, like sentinels in their imperial uniform keeping guard amongst a pack of merry holiday-makers.

"Humph! so you're actually bold enough to ask *me* for a lesson," said one of these little sentinels, and all

the long-tailed flowers, which looked so loosely arranged on his stem, appeared to stand aghast with surprise.

"But do you know, my good young people, that we're a very peculiar folk, and we shall give your small brains no end of hard work?"

"Still we do want to hear as much about you as we can," said Rhoda.

"Well, well, we'll see," said the Orchis. "But not only are we a very extensive tribe, but all our members are so interesting that it seems a pity to pass any by without just mentioning them, and all that ends in making a long story, you know."

"Now I, Mr. Orchis Máscula, otherwise known as Mr. Early Purple Orchis, am one of the best known of the British specimens of the orchideous tribe, and like all my relations I am easily recognized as belonging to that tribe, for, as you can see when your attention has been drawn to us, we are perfectly unlike any other flowers.

"Besides myself there are many other field orchises, of whom I will speak later."

"All the same family as yourself?" broke in Rhoda.

"The same family," retorted her little purple tutor; "I don't know what you mean. Didn't I tell you at starting that we're a very peculiar race, and we don't do

anything like common people? Folks call us crazy and what not, but we don't care if they do; all we do care about is not being bothered by impertinent questions—what our name means, for instance and such like inquisitive questions. Do you see?"

"Oh! yes, we quite see," said Rhoda humbly, and she did indeed, "quite see" now why people called their new teacher eccentric; and she was very glad now that she had not asked him to go to work like all the other flowers, and begin the lesson by explaining his tribe and family name as the others had done. It was quite clear he taught on altogether a different system from that of any other of her flower friends.

"Well, now," said Mr. Early Purple, "I am reckoned one of the common orchises and yet I'll undertake to say, if you were to pull me to pieces and were made to call the pieces by their proper names, you would think my blossom made in the strangest fashion you could possibly imagine. And if you thought that in my case, what would you think of my beautiful and wonderful cousins in South America? Some of these you may see some day, for fresh parties come over to this country every year and take up their abode in nice hot-houses made on purpose to receive them.

"One of these cousins is formed so exactly like a swan,

with its gracefully-curved neck and snowy plumage that it is called the swan orchid, whilst two other kinds are called the dove orchids. The blossoms of one of these latter take the shape of the most perfect dove of purest white colour with outspread wings, the blossoms of the other represent a snowy dove seated on her nest, with her tiny head half turned and her wings slightly raised and tinged with purple.

"Very curious, too, is the frog orchis, whose queer brown blossoms have reminded many an English traveller of these little reptiles at home. On other orchids the flowers are so arranged that they look like a whole shower of white and purple butterflies hovering over the plant, whilst in others the resemblance of the blossoms to different kinds of monkeys, is as perfect as it is laughable.

"And here in our own country, we have also a monkey orchis, who rears his slender spike of pale purple-spotted flowers on some of the chalk hills in the later days of May, but he never seems to me to deserve his name as much as many other countrymen of mine.

"Now the bee orchis is very fitly named, for his lower petal is fashioned exactly like a brown velvety bee with yellow stripes, and so also is the fly-orchis,

whose flowers are about the size of a common house fly, and bear a most striking resemblance to this insect. If you look closely at it, you can even discover its pair of tiny black shining eyes.

Then too there is the lizard orchis, whose queer long-tailed pale lilac blossoms do look very like the little reptile, and I ought not to forget the butterfly and the spider orchises or the green man orchis. But these you must go and hunt out for yourselves, for it is time that I came nearer home and began to tell you something of my own particular self.

"Every part of me is interesting, so we'll begin from my very root. This, besides its root-hairs, consists of two fleshy tubercles or knobs, one large the other small. Both grow at the base of the stem and *below* the fibres which spread themselves above them.

"When we are in flower, the flower stem springs from the top of the *large* tubercle, which bears the smaller tubercle or knob, attached close to its neck.

"By-and-by, when my flower has run to seed, the larger knob will be found withered, whilst the little knob at its side has grown large and plump, and has already a bud at its top.

"Still later the whole of my plant will die except the little tubercle, with its one small bud, which, latter, will

grow up into an orchis stem next year. And now I must tell you what will sound very funny to you, that we orchises make a little journey every year, that is the smaller knob and its new bud moves on, perhaps, three or four inches—some even more than six—from the spot where the parent plant was first content to dwell. Some of us, indeed, are even greater travellers and make very rapid marches underground.

"Now, only one word more," added Mr. Early Purple, "and then I shall have given you a long enough lesson for to-day. Some members of our family have the peculiar fancy for indulging in what are called ærial roots or air roots. This means that instead of burying them decently in the ground they allow their roots to spend their days and nights in the open air, and to draw in their nourishment from the atmosphere instead of from the soil. *I* don't understand such goings on myself, but then we're not all made alike, you see.

"And now, good morning, and be off with you, perhaps to-morrow I may find something more to tell you."

Part II.

"Good morning, Mr. Early Purple Orchis, here we are again," said Rhoda, on the following morning by way of greeting, and in the secret hope that the sound of his title in full might please her queer-tempered teacher.

But such a dead silence followed her remark that both she and Hugh concluded that worthy Mr. Early Purple must have grown either deaf or sulky, and they were half inclined to go away again when, all at once, they heard a jerky, wiry little voice coming out from the midst of his long-tailed blossoms, very like the tone of some crusty old bachelor who hates being disturbed.

"Well, well," said the voice, "we'll go on with my stem then. This is solitary, and what is called succulent, which means fleshy. It bears its blossoms in the shape of an erect cluster of purple reddish flowers in the form of a spike. It usually stands a foot high, and is tinged with a purple hue.

"Now look at my long narrow-pointed leaves, all stained with purple spots; these parallel veins tell you at once that they belong to the class of the monocotyledons. The lower leaves grow chiefly from my root, whilst the upper ones clasp my stem. And

besides these handsomely-marked leaves at my feet, we have smaller ones or bracts, growing on our stalks, behind each one of our blossoms. These, at first sight, might not strike you as leaves, because they are not green, for, to tell you the truth, the blossoms put them into a livery of their own purple reddish colour, after the fashion of some of your grand two-legged folks."

"Oh! yes, I see," said Rhoda, "and each little separate flower-stalk is in purple livery too," and she pointed to the queerly twisted limb on which each blossom of the loosely formed spike was growing.

"Ha, ha," laughed the Orchis, "so you think that's a stem, do you? Well, I told you at starting that we Orchises were funny folk, so you needn't be surprised at anything fresh I may tell you. *That*, a stem indeed! why it is the ovary or seed-vessel of each of our blossoms, and by-and-by if you were to cut it in two, you would find it full of baby seeds. Ah! I guess what you're going to ask next. You're going to ask after my calyx. Well, see if you can manage to find it."

Thus invited, both children bent over the orchis, but though they looked up and down, and above and below each of the blossoms, they could not discover anything which looked to their eyes like a calyx. There was absolutely nothing like a green cup to be seen, that was

quite clear; but presently Rhoda exclaimed, "I know, Mr. Early Purple, you must be like Miss Snowdrop in that, you must have a perianth, because your calyx and corolla seem all in one."

"Right there," muttered the Orchis, "but how many sepals have I got?"

"Oh! I don't quite know," said Rhoda, rather puzzled, but anxious to make the most of her discovery.

"Let me have a look," cried Hugh, "I'm sure I shall find out all about it," and he made such a desperate plunge to secure the purple spike all to himself, that Mr. Early Purple, trembling for his own safety, interfered.

"Come, come, that'll do," he said; "you two children squabbling over the whereabouts of my calyx, are just like your learned folk, whom I believe haven't done quarrelling yet as to where my sepals are. They fuss themselves over the matter a deal more than I do, although it is my own concern. I'm quite content to know that I have three sepals, and that each ends in an acute or sharp point. The two at the side, which look like the wings of my flower, are turned upwards; the middle one bends forward over a dark purple thing, thick and fleshy, looking just as if he were a miser bending over a bag of money.

"As a rule the sepals of the perianth of our tribe are veined, but mine are not.

"And now let us talk about my corolla, which is a wonderful thing. Each of my flowers as you can see is furnished with a spur like the violet, and is supported by its twisted seed-vessel or ovary. The ovary rises from a bract, that queer leaflet in purple livery, you know, or the main stem. The colour of *my* blossom is a rich reddish purple, (in some of my brothers it is a pale lilac, in some the colour is mottled), the centre of the lip is white at the base, spotted and downy. Although at first sight our flower would seem to consist of more parts, it is really, including the perianth, only made up of six pieces, and of these six pieces three are the sepals which we described above.

"Of the three petals, the two upper ones are very small, and stand on each side of that centre sepal, which we compared above to a careful miser, and with this centre sepal the two petals close over together, so as to form a little hood or helmet for the better protection of that mysterious purple treasure. The lower petal stretches out his long hollow spur, just like a tail behind which turns upwards, whilst in front he hangs down his handsome notched and spotted lip of which we spoke just now.

"This petal in many members of my tribe is the most important petal of the three, as it is this lower petal which always bears the resemblance to animal, bird or insect."

"I suppose," Rhoda ventured to suggest, "that the upper petals are too busy guarding the treasure to have time to put on fancy dresses, and turn themselves into monkeys, and bees, and spiders as their biggest brother seems so fond of doing," and not finding herself rebuked by her crusty old teacher for this remark, she was further encouraged to beg him to tell them what it was that was hidden away so carefully in the upper part of his blossom.

"Well, I shan't promise to tell you anything," said Mr. Early Purple, "but perhaps if you come to-morrow and I've nothing better to do, I may find a little time to chat with you."

Part III.

"I was half a mind yesterday," said the Orchis, "to invite you to bring a needle with you to-day, for without some such weapon wherewith to force an entrance into the citadel of my flower, you won't be able to see

much for yourself, and you'll have to take what I tell you on faith. However, as I don't feel disposed to ask you to pierce my heart, I'll just tell you all I can about it, and if you like to go and prick open the inside of any of my brothers growing near me, that will be your concern not mine.

"Now, of course, in other flowers, you have been taught to look for a group of orderly stamens or dust-spikes, standing up in the middle of the blossom, carrying their anthers at the end of their thread-like stalks—which you probably learnt to call filaments—and surrounding a steady-going pistil. And the pistil you found composed of its ovary or seed-vessel, its style or tube which acted as a high road, or at any rate, a link of some sort between the seed-vessel and the stigma, or point of the style.

"I daresay those staid, matter-of-fact, compact-looking servants did their duty very well and thoroughly, as dull-looking people often do; but dear me, I shouldn't like such a sober set about me. But then, I repeat, we Orchises are quite different from other folks, as you will think more than ever when I tell you that we've only one stamen, and he is combined with the style of my pistil, so unless you were told he was there, you might easily think we had no stamen at all.

"And that dark fleshy little thing, half hidden under the hood of petal and sepal combined, which I compared to a miser's money-bag, is my anther, or flower dust pouch. *My* anther is composed of two cells, but in those of other Orchises there are sometimes four and sometimes eight cells.

"If you had a needle, *now* would be the time for you to use it, for then you could open up the purple case just at the sort of seam which divides my anther into two cells. In each cell you would find a tiny, waxy-looking thing, which at first sight you might call a stamen, for it is not unlike one, but it is, in fact, a mass of pollen raised upon a tiny, tiny thread of a stalk.

"And now, where will you look for my stigma?"

"Oh! I'm sure I don't know, do you, Hugh?" cried Rhoda in despair.

"Don't you observe a little moist spot immediately under my anther, and at the base of my largest, lowest petal? This small clammy cavity, or hollow cup, is my stigma. It is placed just in front of the column of my pistil. And this column is, as you know, formed of my stamens and style united; whilst the ovary, or base of the pistil, is that queerly twisted thing which you call a stem, and which, indeed, acts as a footstalk to my blossoms.

"Now, like some other plants, whose acquaintance you may have made already, we Orchises belong to that class of plants called the insect-fertilized plants."

"You mean," said Hugh, "that your stamens or anther are so lazy they won't do their own work; so you have to get in the insects as sort of charwomen."

"Well, the truth is," said the Early Purple Orchis, "my anther hugs its two little pollen masses so closely within the purple case, that I don't feel sure it would ever consent to scatter its gold dust as freely as other anthers in other flowers would do. At any rate, it saves all risk and spares every part of us trouble to employ bees to do the work of carrying the flower dust to and fro, and this is how they set about doing it. First let me tell you, however, that we pay our servants well, for the spur, or long tail of our lower petal, is full of honey, to which, I can tell you, the buzzing brown bee is not slow in helping himself. He is indeed such a selfish fellow, that his only idea is to secure his honey, and it is more by luck than by cunning, that he pays us back by doing us a good turn. For, in his greed to reach our nectar, he thrusts his head against my anther so roughly, that he detaches one, and sometimes both of those sticky glands to which the club-shaped masses of pollen are attached. These he carries

away on his forehead, and deposits them on the stigma of the very next blossom he visits. In this way, you see, all my blossoms are visited in turn, the bee delivering the flower dust at the very door of the seed-house, as you may say, for the stigma is literally the open door to the passage of the ovary or seed-house. Perhaps you may think that my ovary looks rather a flighty sort of fellow, with so many queer twists and whims of his own, but for all that, he does the work of coining the pollen into seed just as well as any of your steady, sleek, round seed-vessels.

"For if some day when all my glory of purple and red have vanished, you pass this way, instead of my clusters of long-tailed blossoms, you will find in the place of each a little capsule or chest made after the fashion of Miss Violet's little seed-chest and like hers divided into three carpels. Each of these carpels is filled with innumerable small seeds. Only, unlike Miss Violet's family, we don't play any practical jokes upon our tender infants by shooting them far and wide; on the contrary, we go very gently to work.

"Very gradually our three carpels or seed-coverings fall away from the frame-work of the little chest, and allow the seeds within them to drop at their own pleasure on the earth beneath. And

now can you tell me, I wonder, what sort of seeds ours are?"

"Oh! we know, we know," cried Rhoda. "Your leaf told us long ago that your seed was one-lobed."

"Or a monocotyledon," said the Orchis. "Well, of course there is a great deal more that I might tell you about myself and my numerous family, but it is wiser not to puzzle you with it now.

"I will only add one caution. Don't believe the people who tell you that we are only highly ornamental plants, and not in any way useful ones, either as regards food or medicine. I for one—everyone must speak for himself, you know—possess a very valuable root, for which in olden days I was highly respected, and ought to be so still. But then people were wiser than they are now, and they used to dry and pound my root, and turn it into a very nourishing flour or powder called salop. This was made into an excellent gruel of which hardworking folks, such as coal-heavers and sailors ate gladly. Then, too, it is a member of our tribe which supplies you with the vanilla which flavours your puddings and ices, whilst another sort of orchis yields a cement or glue which is useful to artists.

"And now, good morning, my dears," and with an

abrupt jerk of his blossoms which was very characteristic of this eccentric gentleman, Mr. Early Purple Orchis dismissed his pupils, who were quite sorry that his lesson was over.

And now the very last page of Lady Science's little book was turned, for the notes referring to the orchis tribe were the last entered there:—

EARLY PURPLE ORCHIS.

Class, Monocotyledons; *tribe*, Orchideæ; *family*, Orchis.

Root, tuberous, consisting of two fleshy knobs.

Stem, solitary, succulent, bearing blossom in form of spike.

Leaves, parallel veined, spotted, clasping the stem.

Perianth, consisting of three sepals.

Corolla, consisting of three petals, lowest petal eight-lobed and spurred.

Stamen and style united, in a central column; *anther*, two-celled; *stigma*, moist, hollow in front of column.

Fruit, three-valved, many seeded capsule.

* * * * * *

"Oh! dear," said Rhoda, "here we are at the end of our lessons and we have still so much to learn."

"So much to learn!" echoed Hugh, "why, what

nonsense, I am sure I know quite as much about all the flowers as they know about themselves."

"Heigh ho! young gentleman," said a voice from a spike of Bluebells at his feet. "Pray, what do you know about *me?*"

"And what do you know about me?" echoed a Cuckoo Pint, bending his crimson body forward from his large green hood.

"And about me?" cried a spray of White Bryony, stopping short in her climbing and looking down from the hedge upon Hugh.

"Or me?" asked the Ragged Robin, who had just been called out of bed by the cuckoo's song.

"Or me?" said the glittering Celandine, on the bank close at hand, "and yet if you don't know about me, you can't know anything about the king of my tribe, the brilliant scarlet Poppy."

"And without counting up any more flowers, what do you know about *me?*" came in a funny little voice from a tall blade of grass at Rhoda's feet.

"Oh! that you're grass, and that's all," said Hugh, who was getting very cross by this time.

"All that *you* know," echoed the tiny blade, "but you'd be dreadfully puzzled only to say for instance how I come to be green instead of any other colour."

"That I shouldn't," retorted Hugh; "of course you're green because you're grass."

"Oh! then suppose you put a heavy brick upon me and left me under it for some days, till I turned a pale yellow, you wouldn't call me grass any more, because I shouldn't be green any more. Eh? what should you call me then?"

"I don't know what I should call you *then*," said Hugh, "*now* I call you a horrid little teasing bore, trying to tell me I've learnt nothing."

"Oh! no Hugh," said Rhoda, "don't you see the flowers and the grass only want to show us how much more we still have to learn, and that instead of having finished we've only just begun. Oh! I do wish twelve other flowers of twelve other tribes would give us a second course of lectures."

Do you, my readers?

THE END.

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