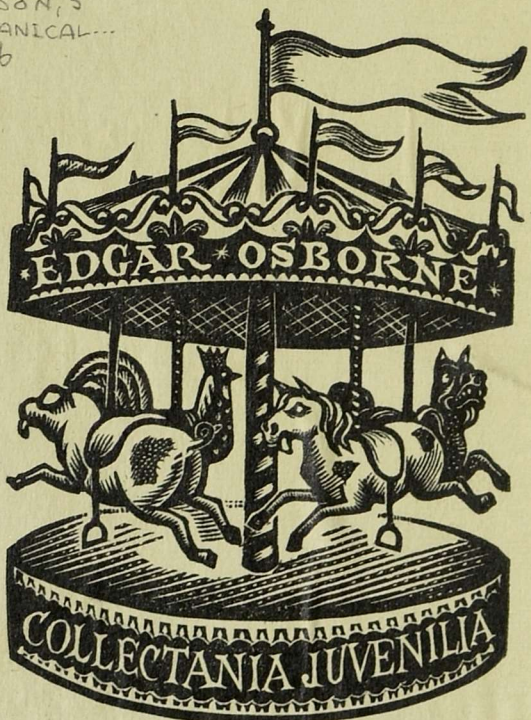
Maria Ann Hurlock

Dd. W.S.r Sept. 14. 1829



BOTANICAL RAMBLES;

AN

Introduction to Botany.

Printed by J. Darling, Leadenhall-Street, London.

Frontispiece to Botanical Rambles.

J Shary scalp.

—festoons of roses and sweet flowers were hung by the amiable Caroline.

BOTANICAL RAMBLES,

Designed as an early & Familiar

Introduction

To the elegant & pleasing Study of

BOTANY.

By the Author of The India Cabinet, Useful Amusement &c

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BOTANICAL RAMBLES.

SEATED in the breakfast-parlour, an interesting girl of thirteen was lightly touching her piano-forte, when the rosy-cheeked Ellen hastily entered the room, exclaiming, "Most delightful news, Margaret! here is a letter from sister Caroline. Are you not glad? Perhaps she is coming home, and then I shall be so happy!"

The music instantly ceased, the scissors were produced, and the letter read aloud to Lucy and Ellen, who both listened in silent attention.

Rose Cottage, Malvern, June 5.

"MY DEAR SISTERS,

"Three months are past since I last took leave of you, but now, we may

look forward one week hoping to meet again. My aunt intends to accompany me home: you will be delighted to hear that under her kind tuition I have been studying Botany. We can take nice long rambles, and pursue this interesting amusement together, for you have often said how much you should enjoy doing so. I assure you, some of my happiest hours have been spent under a shady tree, in dissecting the wild flowers I have gathered: when you are accustomed to it, you will find it very simple and easy; and when absence no longer separates us, our studies and recreations will be pursued with double pleasure. By way of initiating you a little, I will just mention, that a perfect plant is composed of a root, the first and most obvious use of which is, that of enabling the plant to stand firmly in the ground, by serving as a balance to the head; the trunk or stem, which supports the flowers and leaves; the supports or props, and the flowers and leaves themselves. I would advise you to read a very good definition of each of these parts, in

Mrs. Wakefield's Introduction to Botany, from whence I have collected most of my own information, for it is written in a very easy and familiar style, as, indeed, all her works are: there you will find that plants are arranged and divided into twenty-four different classes. You must, if you please, learn their names.

"I hope little Frederic remembers me. Pray give my best love to dear papa and mamma, and join with me in anticipating the happy day that will unite you once more, with your ever affectionate

"CAROLINE."

Many exclamations of delight succeeded the perusal of this letter from an elder sister (who was on a visit to her aunt), and of such an amiable disposition, that she was endeared to every one who knew her: affectionate, gentle, and obliging, her whole happiness appeared to consist in promoting that of others, consequently she was admired and beloved by all the family.

The lively Ellen had escaped out of the room, the library was soon searched, and Wakefield's Botany brought to the parlour in triumph.

"Roots! roots! Caroline mentioned roots first," cried Lucy, peeping over her sister's shoulder; "here is a description of them.—'They are distinguished by different names, according to their forms, as fibrous in grasses; bulbous,' my hyacinths, you know, mamma says, have bulbous roots; 'tuberose, as potatoes, with many other lesser distinctions, expressive of their manner of growth.' If Frederic were but a little older, he could dig some up for us to examine: I should like to understand them all perfectly."

Margaret.

The enormous oaks in the park are kept upright and fixed, by their strong and extensive roots. I believe the chief nourishment of the plant is received by the radical, or fibrous parts of the roots, that, like so many mouths, absorb the nutritious juices from the earth.

Lucy (reads.)

The root also performs the part of a parent, by preserving the embryo plants in its bosom, during the severity of winter, in the form of bulbs or buds.

Ellen.

Next, the trunk or stem, which rises out of the root, and with its branches supports the flowers and leaves. It consists of several distinct parts, as the bark——

"Do you recollect," interrupted Margaret, "that papa shewed us the other day a work-bag and some cloth made by the Indians of the bark of trees? the bark, he told us, consists of three parts, the cuticle, or outer covering, the cellular integuments, and lastly the true bark, which, in old trees, consists of as many layers as they are years old; the innermost being called the *liber*. The bark of plants, papa said, clothes and defends them from injury, and inhales the moisture of the air. The cause of evergreens retaining their foliage during the winter, is supposed to arise from an abun-

dant quantity of oil in their barks, which preserves them from the effects of cold."

Ellen.

The description of the wood comes next. "It is the solid part of the trunk, formed gradually from the inner bark of the preceding year, and supplied with innumerable vessels, which convey the fluids to and from every part of the plant; it also contains others, supposed to be furnished with air, and distributed throughout its substance. The pith is the centre of the vegetable body, and appears to be the seat of life; it is a fine tissue of vessels, usually of a white or green colour."

Lucy.

You remember cousin Charles made some little images for us of the pith of the elder-tree; the delicate rice-paper my butterflies were painted upon, was made of the pith of rushes.

Ellen.

"The tendrils or claspers, are small spiral strings, by which some plants, that are not strong enough to stand alone, sustain them-

selves by embracing other trees and shrubs." The clematis twines around the pillars of the hermitage, the honey-suckle around the alcove, as well as the sweet-pea and many other elegant flowers around the portico, by means of their tendrils or claspers. "Leaves are supposed to answer the purpose of lungs, by imbibing and giving out moisture; and, by their inclination to be moved by the wind, in some degree serve also those of muscles and muscular motions." They are described by different names, according to their forms, I suppose; here are oblong, oval, crescent, parted, winged, tendrilled, plaited, channelled, arrow, heart, halbert, lyre-shaped, and a long, long list.

Lucy.

We had better learn their names by referring to plates, this will make us more particularly acquainted with the variety of their forms and manner of growth. The dinner-bell rings; come, Margaret; papa will be very glad for us to study botany,

especially with such a sister as Caroline, I am sure.

We must go this evening to see poor Dame Mansel, so we will leave our books and drawings for the present.

The long anticipated day at length arrived; the affectionate group, stationed at the library windows, awaited the return of their beloved sister.—Many a coach and carriage passed; at length, Ellen exclaimed in a joyful tone—"Here she is!" The hall-bell rung, Caroline ascended the steps, and was immediately in their arms; mutual congratulations succeeded, with expressions of long-endeared affection; and for the first two or three days, botany was scarcely thought of, for the green-house and flower-garden took up their attention; the charming pleasure-grounds had to be revisited again and again; the prattle of the engaging little Frederic occupied many hours; the aviary was arranged afresh; a favourite goldfinch, doves, and pet-lamb, were ca-

ressed and fed; the poor in the village, who were all well known to Caroline, were inquired after and called upon.

"Well!" said Caroline (whilst they were sitting in the parlour one morning), as she laid down her work and stroked Ellen's rosy cheek, "can you tell me the names of the twenty-four classes, into which all plants are arranged and divided?"

Ellen.

I have taken much pains to learn them, I assure you; I can go on very well, until I arrive at the fifteenth, but that is such a long, *long* word, that really I cannot get on any farther.

"Tetradynamia," replied her sister; "the meaning of this word is the power or superiority of four, and the flowers that belong to it are distinguished by having six stamens, four of which are long, and the remaining two are short. Will you give me that stock out of the flower-basket?—Let us examine it. There you see, four of these little things called stamens are long, and the other two are short; this purple part is

called the corolla; the coloured part of any flower is always called the corolla. Now, my love, you will remember this word: but we must begin regularly. You must first know that the *fructification* includes the flower and fruit, and contains the whole process of perfecting the seeds; it consists of seven different parts. Take this carnation: the calyx, cup, or empalement, is that outer part of the flower, formed of a yellowish green leaf, sustaining the corolla at the bottom, and enclosing it entirely whilst it is a bud. The empalement is either

A cup .....as in the carnation.
A fence .....as in the carrot.
A catkin .....as in the willow.
A sheath .....as in the daffodil.
A husk .....as in oats, wheat, or grasses.
A veil .....as in mosses.
A cap .....as in mushrooms."

Ellen.

I am sure I shall not forget what the *calyx* is, now you have been so good as to tell me: this little outside leaf of the con-

volvolus is the calyx, and in the geranium and rose-bud it is very distinct.

Caroline.

Quite right. Now for the *corolla*. The blossom, petals, or corolla, is that beautiful coloured part of a flower, which first draws the attention, and is frequently regarded as the flower itself, by those who do not examine it. Iron mixes with the substance of most vegetables, and is the cause of these brilliant hues; you must request papa to explain the reason to you.

Margaret.

Then, the corolla is only part of the fructification, and in my favourite rose, the pink petals form the corolla, and in this campanula the purple part, and so on.

Caroline.

Very true. We must now describe the *threads, chives,* or *stamens;* they are composed of two parts; one long and thin, fastened to the bottom of the corolla, called the filament; the other thicker, placed at the top of the filament, and called the anther. Each anther is a kind of case or box,

which opens when it is ripe, and throws out a yellow dust, that has a strong smell; this is called pollen or farina, and is the substance of which bees are supposed to make their wax. The progress of the seed to maturity is well deserving your most curious attention. First, the calyx opens, then the corolla expands and displays the stamens, which generally form a circle within the petals, surrounding the pointal. The farina, or dust, which bursts from the anthers, is absorbed by the pointal, and passing through the style, reaches the germ, and vivifies the seed, which, without this process, would be imperfect and barren. The stamens, pointal, and corolla, having performed their respective offices, decline and wither, making room for the seed-bud, which daily increases till it attain its perfect state. The *style*, *pointal*, or *pistil*, is composed of three parts—the germen, the style, and the stigma. The germen is the lowest part of the pistil; its office is to contain the embryo seeds. The stigma is invariably placed at the top of the style, the

part which connects it with the germen, which is of a variety of figures and lengths, and sometimes seems wholly wanting. The stigma also appears of different forms, but always retains its own situation; for if there be no style, it is fixed on the germen. The seed-vessel, or pericarpium, is the germen of the pistil enlarged, as the seeds increase in size and approach nearer perfection,

The *seed-vessel* is divided into seven kinds :—

Capsule.....as in poppy.
Pod.....as in wall-flower.
Legume.....as in pea or bean.
Berry.....as in gooseberry.
Pome.....as in apple or pear.
Drupa.....as in nectarine or peach, and
Cone.....as in fir or pine.

The seeds, or fruit, resemble the eggs of an animal, and are the essence of the fruit, containing the rudiments of a new vegetable.

The *base*, or *receptacle*, is that part by which the whole fructification is supported; in some flowers it is not very striking, but in others it is large and remarkable, as in the artichoke and thistle.

Margaret.

Have you not forgotten to tell us from whence the bees collect their honey?

> "Cling to the bud, and with inserted tube,
> Suck its pure essence, its ethereal soul."

Caroline.

From the nectary, or honey-cup, an appendage with which some flowers are furnished, containing a small quantity of honey-like juice. The use is supposed to be that of a reservoir, for the nourishment of the tender seed-bud. We may easily perceive it in the columbine, nasturtium, larkspur, and crown-imperial, in which last you will find the honey-cup at the bottom of the petals, in the form of a little hole. The willow-wren creeps up the stems of this plant, and sips the drops of honey as they hang from the petals.

Lucy.

I shall attentively examine these flowers, since it is from them, and others too, I suppose, that the bees collect their treasures, for I admire the persevering industry of

these wise little insects, they are always so busy, so eager to render mutual assistance, and so much attached to their queen, that their whole attentions and affections seem to centre in her; and if she die by any accident, the whole community are instantly in disorder. All their labours cease, no new cells are built, and neither wax nor honey are collected. Papa gave me this account of them.

Margaret.

We must remember that the design of the beautiful flowers which cover the earth, is to produce the seed of future trees and plants; that the coloured leaves or corolla of the flowers are merely protections of the delicate pistil, stamen, and germen, in which last the seed is produced, and for its protection, the pericarp, which we call the fruit.

Caroline.

All the known vegetables upon the surface of the globe have been reduced by naturalists into classes, orders, genera, species, and varieties. Classes are the first

division of plants, and their characters are established on the stamens. Orders are the subdivisions of classes. A genus is an assemblage of species nearly similar. Species are the different forms of plants. And varieties are the trifling differences in plants, produced from seed of the same species, caused by the change of climate, situation, or soil.

As I have said, the basis of the twenty-four classes depends chiefly on the number, the length, and the situation of the stamens; that of the orders, upon the number and other circumstances of the pointals. The first class contains flowers with one stamen; the second with two, and so on to the tenth.

We will dissect this gay tulip. Observe it closely, and you will find there is no empalement: pull off the brilliant petals which form the corolla one by one, and you will find there are six of them. If it be a perfect flower, with both stamina and pistilla, the number alone will be sufficient to determine the class and order. Look at the sort of little column rising in the midst of

the stamens, exactly in the middle of the corolla, and pointing upwards. This, taken in its whole, is the pointal. You will readily guess that the six other bodies are the stamens, composed of filaments and anthers.

Lucy.

Let me give you its whole history. It is a perfect flower, and has one pointal, so it belongs to the first order; six stamens, all of the same length, therefore it must be placed in the sixth class, Hexandria.

Caroline.

Give me a kiss; it is quite a pleasure to instruct you, when I perceive you pay attention.—Now, Ellen, is the long, long word Tetradynamia imprinted on your memory, and can you repeat the names of the twenty-four classes, as Linnæus has arranged them?

Ellen.

CLASS.		EXAMPLES.
1 Monandria	one stamen	Star-wort.
2 Diandria	two stamens	Privet.
3 Triandria	three stamens	Iris.
4 Tetrandria	four stamens	Scabious.

CLASS.		EXAMPLES.
5	Pentandria....five stamens.....	Primrose.
6	Hexandria ....six stamens.....	Snow-drop.
7	Heptandria ...seven stamens ...	Winter-green.
8	Octandria.....eight stamens....	Willow-herb.
9	Enneandria ...nine stamens	Gladiole.
10	Decandria ....ten stamens	Saxifrage.
11	Dodecandria	Agrimony.
12	Icosandria	Peach.
13	Polyandria	Water-lily.
14	Didynamia.....	Snap-dragon.
15	Tetradynamia	Shepherd's purse.
16	Monadelphia	Crane's-bill
17	Diadelphia.....	Sweet-pea.
18	Polyadelphia	St. John's-wort.
19	Syngenesia.....	Thistle.
20	Gynandria	Orchis.
21	Monoecia.....	Melon.
22	Dioecia.....	Hop.
23	Polygamia	Ash.
24	Cryptogamia	Mosses.

Caroline.

The first ten classes are distinguished by the number of their stamina.

The eleventh class, Dodecandria, has twelve stamens, fixed to the receptacle. The twelfth class, Icosandria, has twenty or more stamens, inserted upon the calyx or corolla. You may examine the blossom

of the strawberry. The thirteenth class, Polyandria, many stamens fixed to the receptacle, as the poppy. The fourteenth class, Didynamia, four stamens, two long and two short, always one pointal, flowers ringent, as the fox-glove. The fifteenth class, Tetradynamia.

Ellen.

Do not describe that, I remember it. Six stamens, four long and two short, cruciform or cross-shaped flowers, as the stock-gilliflower.

Caroline.

The sixteenth class, Monadelphia, filaments united at bottom but separate at top, as the rose-mallow.

The seventeenth class, Diadelphia, filaments united in two sets, papilionaceous or butterfly-shaped flowers, as the sweet-pea, the upper lip of which is compared to a banner, the lower one to a keel, and the cloven mouth to wings.

The eighteenth class, Polyadelphia, filaments united in three or more sets, as St. John's-wort.

The nineteenth class, Syngenesia, anthers united, five stamens, one pointal, flowers compound, as the daisy.

The twentieth class, Gynandria, stamens upon the pointal.

The twenty-first class, Monoecia, stamens and pointals, in separate flowers upon the same plant.

The twenty-second class, Dioecia, stamens and pointals distinct upon different plants.

The twenty-third class, Polygamia, various situations, stamens only, pointals only, or perfect flowers.

The twenty-fourth class, Cryptogamia, flowers inconspicuous to the naked eye, though we have good reason to believe there is no plant without the essential parts that constitute a flower. Liver-worts, mushrooms, ferns, and mosses, belong to it.

Lucy.

Thank you, dear sister. Will you tell me the names of some plants belonging to the first class?

Caroline.

There are but few plants contained in this class, and what there are, although simple in their structure, yet, from the minuteness of their parts, are difficult of investigation; neither are they remarkable for their beauty. Our ponds and ditches produce mares-tail. Salt-wort is found on the seashore; when burnt, it produces an alkali, used in making glass. This class has but two orders: Monogynia, one pointal; Digynia, two pointals.

Margaret.

How delightful it will be to search for these flowers!

Caroline.

Plants growing wild in the fields and woods are most suitable for botanising, because those that are used to the rich soil of the gardens, are frequently changed into something very different from what nature made them. We may take a long ramble to-morrow, and see what we can collect; in the evening we will copy our specimens, which will impress the different varieties

on your memory, far better than merely looking at a flower, and then throwing it away.

The third class contains chiefly the *natural* tribe of grasses. Grasses are divided into natural and artificial grasses, of which there are nearly five hundred and thirty species. The former are very numerous in their kinds, and are preferred for lands intended to be kept in grass; the latter belong generally to the seventeenth class, at which we are not yet arrived; they are clover, trefoil, sainfoil, tares, lucern, yarrow, and many other sorts.

Lucy.

Farmers like the natural grasses best, I should think, but they are all useful. Mamma is coming up the avenue. Our French master attends us this morning, and our music will employ us in the evening; so we will agree to Caroline's proposal, and make our first botanical excursion to-morrow, if it be fine.

Margaret.

Well, sister Caroline, whither shall we

bend our steps this beautiful morning? Across the park, round the grove, and through the hay-fields; and then, you know, we shall pass by Cork Hill, through the long shady lane, where we shall, most probably, find plenty of flowers.

Here come rosy Lucy and good-humoured Ellen, swinging a little basket between them; I guess they are going to take some cold meat to Dame Mansel. Do you not admire her pretty rural cottage? the porch is covered with sweet honey-suckle and fragrant jessamine, where

"The bee sits on the bloom, extracting liquid sweet."

Whilst they are gone, let us sit on that stile, and dissect this little plant which I have just gathered by the road-side.

Caroline.

The corolla is blue, divided into four segments or parts, the lowest of which is narrower than the rest, and that opposite to it the broadest: it has two stamens and one pointal, which determine it to belong to the first order of the second class, Dian-

dria. It is called speedwell, but its Latin name is *veronica;* we have several species of it in the garden, which add to the beauty of the flower-beds in the early part of the summer, for there are a great variety. This shrub, by me, is *legistrum* or privet; its stamens are two, which determine it to belong to this class also; the seed vessels are black-berries, which are useful to dyers, as they give a durable green colour to silk or wool, by the addition of alum. Had we looked earlier in spring, on yonder damp heath, I dare say we should have found butter-wort, so named from the glossy surface of its leaves, and used by the inhabitants of Lapland to give milk the consistence of cream, by pouring it over them; we often found this flower on Malvern Hills. Gipsy-wort, so named because gipsies stain their faces with it, enchanter's nightshade, common bladder-wort, and sweet vernal grass, belong to Diandria.

Margaret

Thank you. Let us now try to find some plant belonging to the third class, Triandria.

Caroline.

That we may most easily. This class displays a charming field for the researches of the young botanist; the verdant carpet under our feet is principally composed of plants belonging to it, which, though the least striking, are by far the most valuable of all the productions of nature. As I told you yesterday, almost all natural grasses are included in it, as well as the valerian, the iris or water-flag, rushes, and many others. The fructification of grasses is best observed when they are nearly ripe and their husks expanded, which renders their three filaments easily perceptible. If you will open that gate, you can gather a stalk of quiver-grass, *briza media*. There you see the three stamens and two pointals; therefore, this belongs to the second order, Digynia, of the third class, Triandria.

Margaret.

The oat, I perceive, is the same; what a curiously twisted beard it has, growing from the back of the blossom!

Caroline.

Yes, it is also remarkable for the elegance of its panicle, and its light stalk, waving with the gentlest breath of wind. Canary-grass, barley, wheat, rye, millet, darnel, and dogstail, are ranked with it.

Margaret.

How delightfully the new-mown hay smells! Let us sit down under that large shady oak, whose foliage quivers in every breeze, and wait for Lucy and Ellen. All nature appears happy; how sweetly the birds are singing! the meadows are enamelled with flowers, the water trickles softly below yon verdant bank, the labourers are wetting their scythes at a distance, the haymakers are busily engaged, the azure-arched sky looks serene all around, the oak receives us in his shadow, and soft airs breathe on us like a whisper of the presence of God.

We have an additional inducement for rambling abroad and seeking flowers to botanise—to please dear mamma; she has often said I spend too much time in inac-

tive and sedentary pursuits, my drawing, Italian, and music: she was much pleased when I told her our plan, for she says that botany will contribute to our health, as well as cheerfulness of disposition, by leading us to take air and exercise—we should do whatever mamma likes, for she is always kind.

Caroline.

Yes, we are happy in having such a tender and indulgent mother; she wishes us to pursue this fascinating science, not *merely* as an amusement, but as a pleasing change for some of the trifling objects that too often occupy the time of many young ladies; and, as she said this morning, surely the works of nature must raise the thoughts to nature's God; and is not this elevation the very essence of the enjoyment we derive from them?

We are indebted to the vernal grass for this sweet fragrance; it has only two stamens (contrary to the general tribe), which occasions it to belong to Diandria. Sugar, you know, is produced from a sort of reed,

growing chiefly in the West Indies; it belongs to the third class—at present we are rather too far off to examine it, so we will content ourselves with knowing that the majestic tribe of flag-flowers, the modest crocus, welcome harbinger of spring, and some others, are ranked with it. These are characterized by a spathe or sheath, instead of an empalement.

Margaret.

Here comes Ellen with her little hat off; I suppose she is very warm—her hand is full of wild flowers.

Ellen (out of breath).

I used to try to get a nosegay of the gayest flowers I could find, but now, sister, you see I have brought you some of all sorts, for pretty or not pretty, I suppose we must learn their names.

Caroline.

Well done, little prattler! can you tell me the name of this small and elegant blue flower?

Lucy.

It is, indeed, a most celestial blue, adorn-

ed with such a bright yellow eye in the middle—by its beauty, it well repays the trouble we had in gathering it, for we found it on the other side of the brook at the bottom of the park, and we had to place great stones, and step across one by one.

Margaret.

I said Ellen looked very hot.—Here are five stamens, so it belongs to the fifth class, Pentandria; only one pointal, therefore it must be put in the first order, Monogynia. We will apply to Caroline for its name.

Caroline.

It is the *myosotis*, mouse-ear, scorpion-grass, and is very common in dry pastures, and by the sides of brooks and rivers, though I would advise my young friend not to attempt crossing one again on the strength of it.

Ellen.

Here is another little thing we found growing about there.

Caroline.

Ah! it is the bog-pimpernel, with its

delicately pencilled blossom. There are two other species of this plant, the scarlet and blue pimpernel; they open at eight o'clock in the morning and close about noon, and are, altogether, three of the most elegant plants you can imagine. I see a flower in your hand, Ellen, lightly tinged with pink, and something like a convolvolus.

Margaret.

It is bind-weed, I believe. It must also belong to the first order of the fifth class.

Ellen.

We found this plant in the corn fields. I should think it is troublesome to the farmers, twining amongst their corn, though it is certainly very pretty and elegant.

Caroline.

There is another species of the same genus, that you wreathed around your hat so often last summer; we may frequently see it entwined about hedges and bushes, where its fine milk-white blossoms make it a beautiful ornament; it is called great bind-weed. The primrose, oxlip, and cowslip, the ornaments of our meadows in

spring; the polyanthus and auricula, admired by florists for their variety and beauty; the forbidding nightshade and henbane; the elegant genus, convolvolus; the family of gentians; gromwell; bugloss; comfrey; the neat and elegant centaury, with its rose-coloured blossoms; and the numerous tribe of bell-flowers, all belong to the extensive class, Pentandria.

The plantain, you so frequently gather for your favourite Rafy, belongs to the fourth class, Tetrandria; it has four stamens, all of the same length. The teasel, which is cultivated by clothiers, and used for raising the knap on woollen cloths; bedstraw; the sweet-scented woodruff, which we find in plenty at Sarsgrove; and pipewort, are included with it; but the plants contained in Tetrandria are generally less valuable and interesting than those in the preceding class. I must not forget to mention madder, pond-weed, reed-wort, and dodder, which last is styled *parasitical*, from its clinging and supporting itself by any plant that grows near it.

Lucy.

We passed through the little grove, where I found

> " A melancholy hyacinth, that weeps
> " All night, and never lifts an eye all day."

It is almost withered, indeed, for its season is past; but it was in full blow in May, for you know the village girls' garlands of cowslips looked very pretty, interspersed with these blue-bell-shaped flowers. It consists of one petal, divided into six clefts, and turned back; it has six stamens, so it belongs to the sixth class, Hexandria; one pointal, the first order, Monogynia.

Caroline.

Our smiling Lucy is becoming quite an expert botanist; she has given us a very good description of the poor withered hyacinth. Ellen, too, has made a nice collection of flowers for our subject. Here is the sweet-scented asphodel, claiming a place in Hexandria, but it is a very rare plant; you see the blossoms have six expanding yellow petals, the filaments are

covered with a thick wool of a bright saffron colour, and the anthers are scarlet.

Vegetable nature seems to disdain the seventh class, Heptandria; there are few plants in it, and scarcely any distinguished either for utility or beauty. This is the most common specimen, however, *trientalis*, winter-green, or chicken-weed, as there is only one order, of course it belongs to that, Monogynia, as usual.

Here is a wild rose; it is rather more difficult to botanise than the flowers we have already examined, so we depute it to you, Margaret.

Margaret.

Oh yes! my favourite rose, the queen of Flora's tribe, I will most willingly undertake. There are five petals, and more than twenty stamina fixed to the calyx; it would therefore belong to the twelfth class, Icosandria, but there must be only twenty to that, I suppose.

Caroline.

Although the stamina in icosandrious plants are always more than nineteen, they

are not restricted to the precise number of twenty; and you must remember that they *always* stand upon the petals, or upon the calyx.

Margaret.

Then I am very glad to find it belongs to Icosandria, for there are few noxious plants in that class. Five orders in it—the rose belongs to the fifth, because it has many pointals. We never see a cottage garden without a rose-tree; Dame Mansel has one peeping in at her casement window, and smelling so sweetly. I fancy poor people must be very happy in their nice little cottages, for they generally appear contented.

Caroline.

Yes: contentment is every thing, the sunshine of a well-regulated mind: some may seek happiness in dissipation and amusement, others in grandeur, fame, and honour; may I ever seek it in affection and friendship! with dear papa, mamma, and my sisters, even in the meanest cottage I could be happy.

"Ah!" exclaimed Lucy and Ellen in a breath, "when, to be *good* is to be *happy!*"

"Come," continued the intelligent Caroline, looking at her watch, "it is time to bend homewards. Do not forget your botanical ramble, and we can take another to-morrow."

As Caroline was rising the following morning, she heard some one tap gently at her dressing-room door, and on opening it, the active Ellen made her appearance. "Do you know," said she laughing, "that I dreamed of nothing last night but petals, stamens, pointals, and flowers, and I awoke this morning by six o'clock, and got up and dressed myself, and then ran down the gravel path to the bottom of the meadow, in hopes of finding some more scorpion-grass to copy before you should rise; instead of that, I gathered this fine red flower, which quite took up my attention by its very sweet smell.

Caroline.

It is the great-flowered willow-herb, vul-

garly called codlings and cream; the top shoots have a delicate smell, but it is lost almost directly you gather it. You may amuse yourself with dissecting it, my love: it belongs to a class that is not very extensive, although extremely interesting, one that contains the elegant family of heaths, the beauty of whose foreign sorts has introduced them into our greenhouses, where they do not shrink from a comparison with the brilliant productions of distant countries collected together.

Ellen.

That they do not, I am sure, for even what we found wild on the common last summer, were as pretty as any plants in the greenhouse.

Caroline.

The herb Paris, a curious and rare plant, found only in shady places, with four greenish-coloured petals, four leaves, and one berry, divided into four cells,

> "A berry, the shepherd's esteem,
> An emblem of permanent love;"

as it continues for a long time; the dif-

ferent species of persecaria, and the mezereon, the early blossoms of which adorn the shrubbery in February, belong to it.

Ellen.

Willow-herb has eight stamens, therefore it must be ranked with the rest of its noble friends in the eighth class, Octandria; only one pointal, so it belongs to the first order, Monogynia.

If we might walk as far as the Downs, I believe we should find several varieties of heath, only it is almost too early in the season.

Caroline.

We may find some much nearer home than that. Do you recollect the elegant little tuft at top of the slope—and again, the cross-leaved heath on the bank by the summerhouse, the stalks of which are shrubby, and rise from nine to twelve inches high; the leaves are fringed with airs tipped with globules; flowers round, and a beautiful pale pink; flowering in half a circle. The common heath has the tips enclosed within the blossom, which is bell-shaped; its leaves are opposite and arrow-

shaped. In our happy climate, this plant is but little regarded, except for its honey, with which it supplies the bees in abundance. It is only used here for inferior purposes, such as making besoms and firing for ovens; but it is applied to many economical purposes in the barren Islands of Scotland; the poor cottagers make the walls of their wretched cabins of alternate layers of heath, and a kind of mortar made of black earth mixed with straw, and cover them with it instead of thatch, or else twist it into ropes, and bind down the thatch with them, in a kind of lattice-work. They frequently make their beds with it, laying the roots downwards, and the tops upwards, and thus contrive to make them soft enough to sleep upon.

Ellen.

Poor creatures! whilst we are slumbering on pillows of down, surrounded by every luxury and every blessing. Now we have found a specimen of each class, hitherto, will you tell me where I may search for one in the next, Enneandria?

Caroline.

That class is extremely limited, and presents no British plants of any peculiar use to man; yet the elegance of the flowering-rush, one of the most beautiful of aquatics, or water-plants, would redeem it from neglect, did it not contain exotics of singular beauty and value. Bay, cinnamon, cassia, camphor, sassafras, rhubarb, and the laurel family, belong to it.

Ellen.

Our housekeeper, Mrs. Clarbourn, makes very good pies of rhubarb. Last summer, the laurels in the shrubbery were covered with blossoms, and afterwards with beautiful clusters of purple berries, which I was almost tempted to taste; a gipsy begged papa to let her go in and eat some; he told her that he thought they were very unwholesome; but she did not mind, she filled her hat with them, and the little boy at her back thought them a most delightful treat, so this shews they are not poisonous, as is generally imagined.

Caroline.

The class Enneandria has two orders only. Digynia, two pointals; Hexagynia, six pointals. The gladiole, or flowering-rush, is the only plant found wild in England belonging to it. It grows in the water, and has a round smooth stalk, which rises from one to six feet high, according to its situation; at the top of it is a head, or umbel, of pink flowers, some times not less than thirty, surrounded, at the bottom of the head, by withered sheaths; three short leaves form the cup; the corolla consists of six petals.

Ellen.

Are not umbellate plants those which have a ray of small stems proceeding from the centre, forming an umbel, and terminated by the flowers?

Caroline.

They are: this plant is one, which, from its noble height and fine tuft of flowers, would make a charming appearance in canals, fish-ponds, or other pieces of water, if introduced, or cultured by art; and there would be no reason to fear the utmost se-

verity of the frost, for it is hardy enough to defy the cold of Lapland, and flourishes amidst the rocks on Tornea's hoary brow.

Ellen.

Lapland! oh, that is a cold country; in winter, the sun is absent seven weeks together. There

> " Stern winter rears his giant form,
> His robe a mist, his voice a storm,
> His frown the shivering nations fly,
> And hid, for half the year, in smoky caverns lie."

Thank you! thank you! I will run to papa, and petition him to procure some of these beautiful flowering-rushes, to ornament the fish-pond.

The only plant growing wild in England, belonging to Enneandria! Enneandria! (and away she quickly ran.)

The happy group were soon assembled in the breakfast-parlour, and Ellen recounted the adventures of the morning.

" Papa," said Lucy, " did you not call the flowering-rush an *hermaphrodite* plant?"

Mr. L——.

I did so, my love. Plants which have both pistilla and stamina are called *hermaphrodite;* this is the case with the greater part of flowers; others are called *adrogynous,* the melon and cucumber, for instance; if you examine them, you will find that some of the blossoms have pistilla only, others stamina only, without any mixture of those which are termed hermaphrodite. Some plants have pistilla and stamina appearing on distinct roots. Plants are called *biennial,* when they continue alive two years; and *perennial,* when they continue year after year, as the rose and columbine.

Has Caroline told you that the orders in the first thirteen classes are founded wholly on the number of the pistilla? you may easily remember them by changing the Greek word, *andria,* as applying to classes, into *gynia,* as applying to orders; thus, mono*gynia,* one pointal, from non*andria,* one stamen; di*gynia,* two pointals; tri*gynia,* three pointals, and so on.

Margaret.

Thank you, papa. We have not yet learned how the orders are determined beyond the thirteenth class, and we have only found specimens of the first nine classes; the flowering-rush in imagination, you know.

Lucy.

What is foliation, papa?

Mr. L——.

By this term we understand the state the leaves are in, whilst they remain in the buds of the plants. Linnæus claims the discovery of these distinctions, preceding botanists not having attended to the complicate, or folded state of the leaves, which are either convolute, rolled together; involute, rolled in; revolute, rolled back; conduplicate, doubled together, or with several other variations.

(Caroline enters with a flower-basket elegantly arranged.)

Ellen.

Oh! here is employment enough, now, sisters.

Lucy.

How sweet our favourite honey-suckle smells!

Mr. L——.

You are well acquainted with its beauty and fragrance, but probably have never examined its parts minutely. The corolla is monopetalous and irregular, the tube long, five segments divide the border, which are rolled backwards, and one of them is scolloped deeper than the others. It has five stamens. The seed-vessel is a berry with two cells, placed beneath the flower and crowned with the cup. It belongs to Pentandria, the class wherein we find nature sporting in her utmost luxuriance, and in the greatest variety of aspects. The elegant genus, convolvolus, also belongs to it, and receives its name from the propensity to entwine itself around any thing near which it grows, though there are some species which do not possess that quality.

Ellen.

The great bind-weed, Caroline says, is a species of this genus; it is properly

named, for we often see it in fantastic wreaths upon hedges or bushes.

Mr. L——.

Yes: you can easily distinguish the flowers of this kind from all others, by their large, expanding, plaited corolla, slightly indented at the edge with five or ten notches, the pointal ending in two oblong summits, and the capsule containing two roundish seeds enclosed by the cap.

Margaret.

Then, the sky-blue periwinkle, papa.

Mr. L——.

Very true: though this belongs to another genus in the same class. There are several varieties of it, chiefly distinguished by the different colours of the corolla. Perhaps you will be surprised to hear that the stately elms in the park, rank with the little elegant tribe that adorn your basket; but you must remember that it is not the outward form, but the similarity of the parts, that are invariable, which unites different plants in the same order. Few persons but those of nice observation, know

that this tree bears any flower, because it is small, and appears in a season when the fireside is more inviting to the indolent, than the wholesome bracing walk.

Lucy blushed.—"Oh papa," said she, "I hope I shall never again feel inclined to remain at home, when I may be gaining fresh instruction even amidst the severity of frost."

Mr. L——.

The flowers of the elm appear before the leaves, and soon wither; the calyx has five clefts, and is coloured on the inside; it has no corolla, but the seed-vessel is an oval berry without pulp, containing only one seed, rather globular and a little compressed. The bark of the trunk is crooked and wrinkled, and is used as a medicine in several disorders.

Ellen.

Papa, here is the gaudy tulip, with its striped coral of various hues.

Mr. L——.

Place it in the sixth class, Hexandria, my love, among several other flowers of

eminent beauty :—the hyacinth of different colours and delightful fragrance, the whole family of lilies, the magnificent amaryllis, the great American aloe, the delicate snow-drop, with ice still lingering in its veins, are all arranged in this class ; together with the delicate esculent asparagus, and several plants of medical virtue : the daffodil and narcissus, with their bell-shaped honey-cups, containing the stamens fixed to their tubes : the meadow-saffron with which the meadows are adorned in September, and which you have probably noticed, very much like the crocus, but with pale purple blossoms : the modest lily, emblem of my Margaret, and the fritillary, so called from *fritillus*, the Latin word for chess-board, as its curious marks are fancied to resemble one. So you see our gardens receive many of their most splendid embellishments from the particular delicacy of form, and brilliancy of colours, which belong to flowers of this description.

Lucy.

We have not gone through the basket

yet, papa. Here is the star-of-Bethlem, and the spider-wort.

Mr. L——.

They also are ranked in the sixth class.

Ellen.

And here are the auricula, campanula, lung-wort, and guelder-rose, which last is so ornamental in the shrubbery, with its snow-white balls.

Mr. L——.

They all belong to the fifth class, Pentandria.

The florist, the economist, and the physician, will be all partially gratified with the tenth class, Decandria. It contains some vegetables of no small beauty. There are four orders in it.

If you wish to enjoy a ramble this morning, I would advise you to prepare before the heat of the day advances.

The breakfast things were soon dispatched, and our juvenile party, arm in arm, sallied into the fields.

Lucy, (after staying some time behind.)

Here, Caroline, is a pretty flower, and there are many of the same sort by that moist place in the last field. See, the petals are of a deep red, and jagged at the edge.

Caroline.

It has many names. Ragged Robin, a species of cuckoo-flower, or *lychnis*, wild-Williams, or meadow-pink, and it belongs to the tenth class, Decandria. You will find there are ten stamens, five pointals, the fifth order, Pentagynia. Here is the champion cuckoo-flower, which is placed in the same class and order; but the stamina grow upon one flower, and the pistillum upon another. Do you recollect what papa said such plants were called?

Lucy.

Androgynous. Perhaps this flower blowing about the time of the cuckoo's return, has given rise to its name.

Caroline.

Very probably. There is another species, called white-flowered *lychnis*, which

emits a delightful scent, at six in the evening. If we enter the grove, we shall, most likely, find some wood-sorrel, which also ranks in the same class and order; it generally grows in moist shady places. The straw-berry tree is, you know, a beautiful ornament to our shrubberies, not only on account of its foliage and flowers, but because the red berries of the last season remain pendent upon it during the following one; although they are pleasing to the eye, they are not agreeable to the taste; the country people of Ireland, however, eat them sometimes. Near the Lake of Killarney, this tree grows without culture, on barren limestone rocks, and is considered a great ornament to the romantic views of that delightful situation. You are well acquainted with sweet-William and saxifrage; and Margaret took much pains to rear a sedum last summer, whose beautiful cone of white flowers ornamented the stand in the hall so long. All these belong to the tenth class, Decandria. I had almost forgotten to tell you, that the rich carnation

with its spicy odour, and the whole tribe of pinks, in all their varieties, together with the catch-fly, are also included in it.

Ellen.

Oh! I know the catch-fly full well: it is very common in gardens; a *viscous* matter surrounds the stalk, under its flowers, to prevent insects from stealing the honey or eating the farina, which fertilizes the seed. Are there no more wild plants belonging to Decandria.

Caroline.

Yes: spurreys of different sorts. In the corn-spurrey the leaves grow in whirls, the stems are thick at the joints, and it is found in corn-fields and sandy places. The stem of the knotted spurrey is sometimes trailing, bearing a white flower, somewhat out of proportion. The parts of fructification highly embellish this small but elegant plant. Corn-cockle, which has one large purple flower, and is common in corn-fields; and soap-wort, a very rare plant, sand-wort, star-wort, stone-crop, and stitch-wort, may readily be known by their parts

of fructification, as belonging to the tenth class.

Possibly to-day we may not meet with any plant in the eleventh class, Dodecandria. I will describe one to you, that we may proceed regularly. Although I once told you that the flowers belonging to it have twelve stamens, yet they sometimes vary, and include those whose parts of fructification contain from twelve to nineteen; some plants have less, and others more than these: indeed, the number is so uncertain, that you must make it an infallible rule, to observe that the stamens are fixed to the receptacle, that part by which the whole of the flower is supported. Grass-poly, whose tall purple spikes adorn the banks of rivers very splendently in July and August. Loosetrife, somewhat resembling it. The common agrimony, with its spikes of yellow blossoms, in which the number of stamens is very uncertain; you may find twelve in some plants, sometimes ten, and not unfrequently seven; it has a small calyx, cut into five segments, sur-

rounded by another cup, a corolla of five petals, growing to the cup, and one or two roundish seeds in the bottom of the calyx; the stem-leaves are winged, the odd one at the end supported on a leaf stalk; the seeds are covered with bristles. House-leek we often see on old walls and roofs of cottages. Dyer's-weed is found on barren ground, or on uncultivated spots; it is well known as affording a most beautiful yellow dye for cotton, woollens, silk, and linen, and is that which is commonly used by the dyers, as it gives the brightest dye. The yellow hue of the paint, called Dutch-pink, is obtained from the roots and stems of this plant, in which the quality of tinging resides. The ancient Britons are supposed to have stained their bodies with the juice of it.

Ellen.

Will you describe the flower to us?

Caroline.

The cup is divided into four segments; there are three petals, the upper one, bearing the honey-cup, is divided into six parts.

The petals that grow on each side and opposite to each other have only three segments, and sometimes two very small entire petals grow below them. The flowers blow in a nodding spike, following the course of the sun, turning towards it when it rises, and bending after it till it sinks beneath the western horizon. At night, it points towards the north. A cloudy sky has not influence enough to prevent the faithful attachment of this flower to the sun.

All I have mentioned belong to the eleventh class.

"Well, then, we have proceeded as far as my favourite class, Icosandria, in which is included the ever beauteous flower 'blushing celestial rosy red," said Margaret, seating herself on the grass, and twining a wreath of wild dog-roses around her straw-hat. "Did you not tell me that the blossom of the hawthorn belongs to the same class?"

Caroline.

Yes: and there are many shrubs which find a place in it, though I would not have

you infer from this, that it is confined to trees and shrubs, for there are many herbs ranked with them.

Some plants of this class form a natural one, the fruits of which are pulpy and eatable. The apple, pear, cherry, peach, nectarine, apricot, plum, and medlar, are of the number.

Lucy.

We have a medlar-tree by the hermitage.

Caroline.

You must not forget that the classic character of Icosandria consists not so much in the number of the stamina, as in their situation; they always proceed directly, or with the parts of the corolla, from the calyx, but not from the receptacle, as is common in other classes. The petals are also fixed to the sides of the cup by their claws, and the cup consists of one leaf, which is not flat, but hollow.

Margaret.

Do not the rasp-berry and straw-berry belong to Icosandria?

Caroline.

Yes: perhaps you can find some wild strawberry blossoms, if we go farther into the wood, and then we can examine one; the cup is divided into ten segments, but the petals are only five in number; the seeds are scattered upon the surface of the receptacle, which we call a berry. See! our young botanist is bringing a fine bunch of flowers, in which the poppy displays her gaudy suit, and makes a very gay appearance. Now, Lucy, I will depute that to you, for the technical terms and a grand illustration of them.

"Linnæus must have been a very ingenious being," said Margaret, "to seize on the variation in the number of the stamina, as a means of classing the vegetable kingdom."

Caroline.

He was indeed; his whole life was devoted to the arrangement of the works of nature. He improved the system of botany very much, or, rather formed a new one, superior to any invented before, upon a

plan nearer approaching to perfection, and depending on parts less liable to variation.

Lucy, is the poppy yet dissected?

Lucy.

It has many stamens, more than twenty, springing from the receptacle, contrary to the former class, where they were always attached to the cup. It must belong to the thirteenth class, Polyandria, and to the first order, Monogynia, having only one pointal. It is what you told me one day is called a polypetalous plant, for the blossom consists of four petals, or parts; if there were only one petal, then it would be monopetalous.

Caroline.

From this originate the many varieties in the garden. It has a cup of two leaves, which fall off as the flower expands, a corolla of four petals, and a one-celled capsule, crowned with the summit, and opening beneath it with many holes; through these the numerous small seeds find a passage. The seed-vessel in some species is round, in others oblong; it is smooth in

some kinds, and bent with strong hairs in others; the number of rays in the summit is not always the same.

Ellen.

What a beautiful bright scarlet colour it is! The field I gathered it in looked like a carpet; it was almost covered with poppies.

Lucy.

Papa said that opium, which mamma took last winter when she was so ill, in hopes of procuring sleep and relieving incessant pain, was made from the milky juice of the white poppy; so I am sure I shall love Polyandria, since it possesses a plant that was so essential to dear mamma's recovery.

Margaret.

Since we have begun to study botany, how much interest does every delightful walk excite! we pass from plant to plant, from flower to flower, and find that every one possesses beauties, calculated to inspire us with admiration and gratitude.

Caroline.

But I am often surprised to see how in-

differently some people appear to regard the verdure of the fields, adorned with flowers, thinking, perhaps, that the gay corolla constitutes the whole of the blossom, and often, more probably, without thinking at all about it.

> "Full many a flower is born to blush unseen,
> And waste its sweetness on the desert air."

I remember the time when we were delighted to carry home a large handful of the brightest beauties we could find, little perceiving how much wisdom was displayed in every plant and in every leaf.

Lucy

Look at poor Ellen! her muslin frock is finely sprinkled, but she appears to hold in her hand the triumph of victory over the mud.

Ellen (smiling.)

Sister Caroline, you told me that the *nymphea*, or water-lily, is the most splendid aquatic we have in the thirteenth class; so I was determined by the aid of your parasol to reach one; my foot slipped; however, it

it has not hurt me. This must be polypetalous; here are as many as fifteen delicate white petals, and they grow in several rows resembling a double flower.

Caroline.

This flower opens about seven in the morning, and closes about four in the afternoon, and then lies down on the surface of the water. The summits are numerous and placed in the circle, corresponding in number with the cells in the seed-vessel. As soon as these stately water-plants have perfected their fructification, by the absorption of the farina by the pointal, their long stalks, which always grow in proportion to the depth of the water, in order to raise the corollas above it, refuse their support, and the flowers sink down many feet beneath the surface.

Lucy.

Now, will you tell me the name of this elegant and beautiful flower?

Caroline.

Where did you find it?

Lucy.

Upon that soft hilly bank on this side of the grove: the blossoms that are not perfectly blown are nodding; the corolla is yellow and consists of five petals; the cup has five leaves: the seed a capsule. It grows rather shrubby and trailing; the leaves are oblong, hairy, opposite, and turned back; the flowers in bunches.

Caroline.

It is the sunflower, or dwarf-cistus. I perceive you have the celandine also, which is an umbellate plant. Both of them belong to Polyandria.—Ellen, my love, it will be best for us to return home, to change your frock, and rest ourselves, for the sun begins to shed his sultry beams.

We must leave the *ringent* tribe, which is contained in the fourteenth class, till to-morrow, but we can amuse ourselves this evening with copying the specimens we have collected, and writing their botanical descriptions, which will impress them on your memory far better than a mere verbal explanation would do.

Again the lively sisters proceeded through the pleasure-ground.

The following morning the sun arose with unusual splendour, and darting his rays through the window curtains, once more awakened our happy Ellen.

Lucy was soon roused, as well as her cousin Charles, who was on a visit at the Grove.

In high glee they for some time amused themselves in the library.

At length, throwing down his counters and closing the travelling-map—"Come," said Charles to Ellen, "we have journeyed completely round the world, we have explored Europe from north to south, searched the interior of Africa, visited America, and traversed the sandy deserts of Arabia—we have found that

'E'en in Lapland's land of snow,
Lilies spring and roses blow;
E'en on Arab's desert sand,
Showers refresh the thirsty land;
And, making every place his care,
That God is present every where.'

"Come," continued he, after a pause, "let us go into the wood, and like Godfrey and Rosamond, you, Ellen, shall be Zenobia, Queen of the East, and I will be Aurelian, the Roman Emperor; we must make two green helmets of rushes, one for you and one for myself; I will make a bow of sallow too, and a spear; at the bottom of the pleasure-ground shall be our field of battle, if you like. Come," continued he again, throwing open the glass door that led to the lawn; and leaving Lucy to an interesting tale, away they quickly ran, hand in hand, down the hill, and through the shrubbery, until they arrived at a most fertile field of battle, surrounded by spreading oaks.

Charles.

Oh, Ellen! there are some excellent rushes on the other side of the fish-pond. We will go round to the Chinese bridge, and then we shall be able to procure them more easily.

The active girl was soon over, and leaving her cousin very busily engaged in cut-

ting some long rushes for the helmets, she followed a little winding track in the wood, which led to a rural glen, thickly covered with tall majestic flowers of a crimson hue; gathering one, she hastily returned exclaiming, "I cannot be your Zenobia, Charles! Look what a noble warrior! You should have pitched upon yonder valley for your field of battle, surrounded by this extensive tribe. I must know its class and botanical description; forgive me—but you are so good natured that I know you will agree to a truce to-day. We will hang our bows on this beech-tree, and to-morrow morning, if you please, I will be Queen of the East."

Charles proved Ellen's assertion of his good humour was true, whatever his disappointment might have been, for he very obligingly smiled, only remarking, what a beautiful tree the beech is, throwing out its branches so regularly, as almost to touch the ground, and that he would employ himself in picking up some nuts for his squirrel, as soon as the helmets were finished.

Caroline and Margaret were walking

down the shrubbery, to summon our Emperor and Queen to their basins of milk.—"I am glad," said the former, addressing herself to Ellen, "to perceive that you have found one of the most splendid flowers growing wild in England: yesterday I said we must then postpone the ringent tribe, so it is just *a-propos*, for this belongs to it, and to the fourteenth class, Didynamia. It is the *digitalis*, or purple foxglove; the stem sometimes rises from three to six feet high, and as you see, is adorned with pendulous bell-shaped flowers hanging one above another in a very long spike: they are of a fine crimson purple colour, elegantly mottled withinside with spots like eyes; the segments of the calyx are of an oval pointed shape, and the leaves are large and wrinkled. Although it is one of the most elegant of native plants, it is most powerfully poisonous, but has been successfully used in consumptions—great caution, however, is necessary. There is another species of it bearing milk-white

blossoms, which makes a pretty variety in the garden.

The essential character of the fourteenth class consists in four stamens to each flower, one pair shorter than the other; the shortest pair grow together, and adhere to the shaft of the pointal. The orders are not distinguished, as in former classes, by the number of the pointals, because none of these flowers have more than one, which, with the stamens, is enclosed by an irregular corolla of one leaf. The way in which the seeds are disposed, is the circumstance upon which the respective orders depend. There are but two orders: the first, called Gymnospermia, has four naked seeds fixed to the bottom of the cup, without any seed-vessel; plants belonging to this order are generally odoriferous. Among them we may find marum, mint, organum, horehound, baum, common thyme, with its woody stems, and ground-ivy.

Ellen.

What is the reason of those little swellings, that I frequently found upon the leaves

of the ground-ivy, when I was gathering it to make dame Mansel's tea?

Caroline.

They are formed by a small insect; if you open one, you will see it is composed of many cells.

The other order, Angiospermia, has the seeds enclosed in a seed-vessel; it is less extensive and valuable than the former, but the fox-glove claims some admiration for it. Shall we go to the kitchen garden, and probably we shall there find some more plants or herbs, which will serve to illustrate the distinction.

Lucy now joined her sisters, holding in her hand a collection of the richest of Flora's beauties.—"I have been gathering some flowers to ornament mamma's vases," said she, "and for once, Caroline, will you confine us no longer to the fields and hedges, but allow me to shew you some flowers I have found, which are contained in Polyandria, for, you know, we had time yesterday only to examine the nymphea and poppy, at least in

that class. Here are the larkspur and columbine, they have both capsules, no cup, a corolla of five petals, and a numerous set of stamens; in both of them the nectary is very conspicuous; in the larkspur it is cloven, horn-shaped behind. The columbine has five equal honey-cups, in the shape of a cornucopia, placed alternately between the petals. I am right—am I not?

Caroline.

Quite so, my love: as I told you before, the stamens in the thirteenth class are numerous, always growing from the receptacle, which is a grand distinction between it and the preceding class. The objects in the one of which we are speaking, are many of them pleasing to the eye, but unlike those in the other, being frequently poisonous and injurious to the human constitution. I see some of the greatest ornaments of our garden in your hand—the anemone and ranunculus. You have omitted telling us that they too are included in Polyandria.

Lucy.

Do the wild anemonies in the wood belong to the same class also?

Caroline.

Yes: we owe all our variously-coloured anemonies to two species, both found in woods in the month of April; this plant is distinguished from its friend, the ranunculus, by the want of an empalement, which in the latter consists of five leaves; but the essential character of this genus is marked by the honey-cup; in some species it is a naked pore, in others it is surrounded by a cylindrical border, and it is sometimes closed by a scale indented at the end.

Lucy.

Here is the globe-flower, with its large yellow blossoms, and the delicate white hairy cistus.

Caroline.

There are three kinds of butter-cups, which are species of the ranunculus, and which, you well know, give a tinge to our meadows by the brilliancy of their bright yellow flowers.

"Scarce so many stars
Shine in the azure canopy of heaven,
As king-cups there are scattered, interspersed
With silver daisies."

There are, as I said, three sorts: one of them has a bulbous root, something like a turnip, the leaves of the cup are bent backwards, the fruit-stalks furrowed, each supporting one blossom. The second sort has an open cup, and throws out creeping suckers; the last grows taller than the other two, its cup is open, and the fruit-stalk round.

This class has six orders. It contains the marsh-marigold, a plant you have frequently found by the lake. The tulip-tree, which we have so often admired in the shrubberies for its singular and beautiful foliage, blossoms, and fruit; we have some thirty feet high, as large as a good-sized oak; we must gather a blossom and examine it; you will find it has a calyx of three leaves, and six petals, almost transparent, a light orange withinside and green without. The lime-tree, the fragrant blos-

som of which is the delight of the bees; it seldom brings more than one seed to perfection, and this pushes aside the others that are barren, so that one who did not accurately observe it might imagine that the seed-vessel had but one shell, whereas it has five. Hellebore found in woods and dry places in a chalky soil; the flowers are of a yellowish green, nodding, with very short honey-cups, forming a circle round the stamens, their shape resembling a tube, with the mouth divided into two lips. The clematis, traveller's joy, virgin's bower, wild climber, or honesty.

Ellen.

Oh yes, I know that full well, it is beautifully entwined around the trellis-work of the hermitage; and it often grows wild, clinging to any thing upon which it can lay hold. When we went nutting last summer, the hedges were quite covered with it, hanging in charming bowers.

Caroline.

In the wild clematis, the petals are green on the outside, cream-coloured within, and

rolled back, scored and woolly. The styles become very long, slender, and crooked, and covered with fine silky hairs, which give the whole plant a downy appearance. Our clematis is purple; there are single and double, white and purple, cultivated in gardens.

Ellen.

It is quite a favourite of mine, I assure you, and so indeed is Polyandria altogether, for I love the good Cowper—you know he wrote 'the Dog and the Water Lily'—now the water-lily belongs to this class, undoubtedly I must admire it!

Lucy.

The poppy too—do you forget mamma?

Caroline.

Well done, little reasoner!

The ringent tribe must again rest contented, until we can find time to attend to it.

The breakfast-bell rings—let us hasten our walk.

As they ascended the steps, they were

welcomed by Mr. L——, who from a distance with heartfelt satisfaction had observed his intelligent girls.

"Well, my Lucy, and is the prize adjudged to you?" said he, regarding her flowers; "they are very sweet, cultivated in a genial soil, and under the care of a skilful gardener; but how true it is, that

> 'Not a tree,
> A plant, a leaf, a blossom, but contains
> A folio volume. We may read, and read,
> And read again, and still find something new,
> Something to please, and something to instruct,
> E'en in the noisome weed."

The sisters followed their beloved father into the breakfast-room, where their mamma was already seated, and the morning's adventures were again the subject of conversation.

After this social meal, they repaired to the garden, and were there gratified by procuring many specimens in the fourteenth class, Didynamia.

Marjoram, known by a spiked fence;

the flowers growing in roundish spikes, the leaves oval and pointed, produced on leaf-stalks, with purple ringent blossoms; the whole plant a warm aromatic.

Mint, with stamens distant and upright, and one pair much longer than the other.

Common thyme, with its woody stems, purplish red blossoms, and coloured calyx, surrounded withinside by a small circle of white hairs.

Basil-thyme, distinguished by the lower lip of the corolla being notched, and marked with a raised white spot in the shape of a crescent.

Self-heal, whose generic character consists in its forked stamens, the tips fixed to the threads beneath the top, and adhering only to one of the divisions of the fork.

"Indeed," exclaimed Margaret, "what papa said this morning is very true, for in the gardener's wheelbarrow I have found this—it is a ringent plant, and a species of nettle, I think."

Caroline.

Yes: the red dead-nettle, or archangel,

is a weed generally regarded with contempt, but a pretty ornament to the banks of ditches in the early part of summer. Snap-dragon belongs to the fourteenth class; also, the bugle, with its blue and white blossoms; woundwort; betony; germander; common and lesser skull-cap, which plants are distinguished on the banks of rivers by their singular and beautiful empalement, or calyx, which enclosing the seeds as a seed-vessel, resembles in its external appearance a helmet with its crest. Most of the plants I have already mentioned belong to the first order with naked seeds. I will now tell you the names of some contained in the other order with covered seeds. Great tooth-wort is a plant that grows only in shady places, where the rays of the sun can scarcely penetrate, being almost destitute of leaves, and such plants alone can live without the solar light. It is very rare, but we will search for it in the grove next spring, being mostly found in woods and shady places, though not entirely confined to them; it is sometimes discovered in a

very light dry soil, and so entangled with the roots of some neighbouring tree, especially those of the hazel, that it is termed parasitical.

Lucy.

Will you describe its blossom?

Caroline.

The flowers grow in a spike, from one side of the stem, in a double row, the leaves forming a double line opposite to them; the blossoms are of a pale flesh colour, hanging down; the capsule is roundish, but terminating in a small point, it has one cell and two elastic valves, surrounded by the cup, which is large and expanding. Yellow-rattle you may readily find in the meadow; the seeds are enclosed in a loose membrane; when ripe, they make a rattling noise in the capsule, whence its English name is derived—the Latin name is *rhinanthus*. The trailing branches of the ivy-leaved snap-dragon, variously interwoven, often cover old moist walls with a thick tapestry, and when in blossom make an elegant appearance: the leaf-stalks are

very long, bending like tendrils; the blossom is pale purple; palate yellow and shaggy, with orange-coloured hairs, and a slender crooked nectary; the seeds are wrinkled like the kernel of a walnut.

Ellen.

And the whole plant is smooth and shining. We have one running all over the old wall by the greenhouse.

Now, sister, another, if you please?

Caroline.

There are several other species of snapdragon; I must mention one, the fluellin, a perfect beauty, the corolla is so regularly formed; the upper jaw is yellow, the lower a bright purple; the leaves are egg-shaped and woolly, and the stems trailing. Marsh lousewort is not a very common plant; it is found in moist meadows, or in shallow brooks, where you might fancy it coral, from the dark red jagged appearance of the leaves; the blossom is pink, the calyx crested with dots. Brown rape has a cup with either two or five clefts, and a gland

at the base of the seed-cup, for the purpose of secreting the honey. The stem and flowers sometimes appear of a purplish tinge, but the whole plant is generally of a brown rust colour, and in full bloom has the appearance of a withered plant. Painted-cup, or bartsia, has yellow blossoms and filaments rolled in a spiral form, under the upper lip of the blossom, and is distinguished by its coloured cup. The common yellow toadflax grows very frequently upon banks by the roadside, which it embellishes with its beautiful heads of flowers, growing upon an upright stalk, thickly covered with long narrow leaves of a bluish colour; the under lip of the corolla is woolly within, and by projecting closes the mouth; the chaps are orange, but the rest of a pale yellow colour; the blossom terminates in a long spur. Plaintain mudweed is found in gravelly places, where water has stood during the winter; its blossoms are white without and reddish within, and the leaf-stalks are very long. The figwort we find in watery places, or on the

banks of rivers; its corolla is a dirty red, and has a globular tube, with a narrow border divided into five segments; the two upper ones erect, and larger than the rest, those on the sides spread open, and the lower one turned back. Meadow cow-wheat has a full yellow blossom, very much compressed, the notch on its upper lip scarcely perceptible; the lower lip has two orange-coloured rising plaits; the tube is straw coloured; the seed-vessel a yellow glandular substance at the bottom of the fore part, doubled down, and so brittle as not to admit being straightened; it generally grows on the skirts of woods. And now, I fear, I have almost exhausted your patience.

Ellen.

That you have not, I am sure. It will be delightful to look for all these flowers—doubly delightful now you are with us.

Caroline.

Suppose we extend our ramble to yonder fields, in hopes of finding some cruciform plants, as we are now ready to enter

the fifteenth class, Tetradynamia. This, again, contains only two orders, distinguished by the seed-vessel; the first called Siliculosa, comprises those that have a short roundish pod or pouch for a seed-vessel, frequently furnished with a shaft, in some kinds as long as the pouch itself; shepherd's purse you may find almost any where, and it will be a very good specimen; the proper season for its flowering is in April or May, but its blossoms are seen nearly the year round. The soil from whence it derives its nourishment has great influence both upon its height and the shape of its leaves; in some places it is not more than two inches high, when it flowers and perfects its seeds, whilst in other situations it reaches to two or three feet. It has obtained its English name from the shape of its pods, which are like an inverted heart, deeply notched at top, and plainly distinguishing it from the others among which it ranks.

Ellen.

I shall seek for one of these curious purses

presently, when you have described the other order.

Caroline.

The second order, called Siliquosa, has seeds contained in a long slender pod; *siliqua* being the Latin word for pod.

Ellen.

I have not forgotten the explanation you were so good as to give me of this class.

Look at yonder field—how richly it is covered with yellow flowers! what can they be?

Caroline.

Run forward, my love, and bring us one. We will sit down on this stile, and wait your return.

Margaret.

How active she is! her whole attention and thoughts seem absorbed in botany.

Ellen (quickly returning).

I know now what they are—cabbage flowers: and if you will listen to me, I will tell you all I can about them. The corolla consists of four flat leaves, opposite to each other, in the shape of a cross,

therefore it is cruciform. Now I will pull off these petals, one by one—you see they are fastened by long claws within the flower-cup. The little leaves which form the calyx are erect, and of a light green colour; it has four honey-cups, one placed between each short stamen and the pointal, and one between each pair of the longer stamens and the cup. But I should have said, that there are six stamens, not all of the same length; two are much shorter than the rest; therefore, as you told me long ago, it belongs to the fifteenth class, Tetradynamia; which word implies four powers, or the power of four, as if the four longer stamens were more perfect than the two shorter; it belongs to the second order, Siliquosa, because its seed-vessel is a pod, in the shape of a cylinder, flattened at the sides, and containing several roundish seeds.

Caroline.

Very accurately described. Botanists have made the plants in this class constitute a natural family, and they are wholly innoxious; but most of them have a biting

taste and a disagreeable smell in their leaves, though the flowers are almost all fragrant, and indeed some of them remarkably so. What do you think of wall-flowers and stocks?

Lucy.

They are cruciform, so they are of this kind.

Caroline.

Yes, all cruciform flowers. We have many beautiful varieties of wall-flower, both double and single, differing in colour from the pale yellow to the deep orange, but none which have a more delightful scent than the wild one; the base of each of the short stamens in this, is surrounded by a honey-cup gland, that causes the *hunched* appearance of the cup, which perhaps you have noticed. The pungency of taste which so many in this class possess, has caused the young leaves and shoots to be used in sallad herbs, thus we have mustard, cress, and water-cress.

Lucy.

We used to find water-cress in the little

running brook in the park. It has wing-shaped leaves, with white blossoms, and is a very pleasant sallad.

Caroline.

Mustard differs a little from cabbage, although nearly allied to it, in having an expanded cup, and the claws of the petals being nearly upright. In both, the honey-cups are placed in the same manner. The pod is rough, and the partition generally longer than the valves. One species, common in corn-fields, has a smooth pod, with many angles made by the seeds. The leaves are harsh and deeply indented; the blossom it bears is yellow, which produces brown seeds. The common sort, whose seeds reduced to powder are so much in use at table, has also a smooth pod, the lower leaves are large and harsh, but the upper ones smooth and without indentures; not only the blossom is yellow, but the cup also.

Ellen.

Horse-radish too I saw in the garden; it

has white flowers, and the leaves are spear shaped and scolloped.

Caroline.

To those already mentioned, we might add many more growing wild, as Jack-by-the-hedge, or sauce-alone, so called from its smell resembling garlic, with heart-shaped leaves and white blossoms; it is sometimes used with lettuce in sallads. Turkey-pod is found on dry sandy banks, walls, roofs, or corn-fields; the flowers are insignificant, small, and white, and the stem from an inch to a foot high; it is furnished with four honey-cups, so very minute as only to be perceived by those who are already exercised in botanical dissections, and even then not without a magnifying glass; each is composed of a reflected scale, one within each leaf of the cup. Ladies-smock adorns the meadows and fields with a purplish red flower. Wormseed has small yellow blossoms, pods long and narrow, with four edges; the common sorts known by the pods growing close to

the spike. Rape are very similar to mustard seeds, and from both an oil is pressed out, of the mild tasteless kind, as it is likewise from the coleseed, another product of this class. Then there is the common radish, with the root of which you are so well acquainted.

Lucy.

I think I have found another plant; it is sometimes put into winter flower-pots; it has a very remarkable seed-vessel, a perfectly round, large, flat pouch, which after having shed its seed, remains on the stalk, and looks like a thin white bladder.

Caroline.

The plant you have mentioned, my love, is commonly called honesty, but it is very different to the other honesty, or wild clematis.

Now, I think, you each understand that you cannot mistake Tetradynamious plants, if you *always* remark the six stamens, four longer than the other two, a single pointal, changing either into a pod or pouch, containing the seeds, the four opposite petals

of the flower, and four leaves of the calyx.

Ellen and Lucy.

We shall not forget these plants, although Tetradynamia is such a long word. Thank you, good Caroline! (and taking her hand, they proceeded down a shady lane).

Margaret.

There is something particularly delightful in the study of botany; I prefer our charming rambles now, even to music and drawing themselves. I wish it was more generally cultivated.

Caroline.

The Prince of Naturalists distinguishes the three kingdoms, animal, vegetable, and mineral, thus — stones *grow* — vegetables grow and *live*—animals grow, live, and *feel*. The existence of all vegetables may be regarded as mechanical, and bespeaks the contrivance of an all-wise and all-powerful Creator. And nothing is more wonderful than the means of nature for the preservation of seeds, and the contrivances by which they are distributed. Some, you

know, are provided with downy wings, as the dandelion or thistle; others are blown by the wind into distant places, and preserved by their coverings until the sun's rays in the following spring cause them to bud. Whatever was the position of the seed when put into the ground, the green sprout will struggle upward into the air, and the fibrous shoots strike downward into the ground, and imbibe, transmit, or pump up the moisture as nourishment to the plant.

Botany would be an almost ceaseless and unattainable science, were we to endeavour to learn the peculiarities of every plant, one by one; but the difficulty is greatly lessened by classing those together in which there is a similarity in some one point.

Ellen.

The Prince of Naturalists! He must be Linnæus! Will you give me some account of him?

Caroline.

Charles Linnæus was a native of Swe-

den, and the son of an obscure clergyman in that country; his father was a great admirer of the vegetable productions of nature, and adorned and ornamented the environs of his own rural mansion with the natural produce of the neighbouring groves and woods.

Lucy.

Then Charles caught the taste from him, I suppose.

Caroline.

Yes; young Linnæus caught the enthusiasm, and early imbibed the same taste with so much warmth, that he was never able to bend his mind to any other pursuit. His father intended bringing him up to the church; but he evinced such a dislike to theological studies, to which his nature was averse, that his relations, angry and disappointed at his want of application, proposed binding him apprentice to a shoemaker.

Lucy

To a shoemaker! ah! how little they knew how to appreciate his genius!

Caroline.

This plan was happily frustrated, for he was destined to fill a more noble and distinguished station in life. A physician named Rothman, observing him to be a lad of genius, compassionated his situation, and relieved him from it, by taking him into his own family, and instructing him in the science of medicine.

Ellen.

I am very glad of that. What happened to him next?

Caroline.

His kind benefactor lent him Tournefort's Elements of Botany to read, which revived his former taste for the productions of Flora, and decided the cast of his future character.

Margaret.

Rothman then is well entitled to our gratitude.

Caroline.

From that time Charles devoted his leisure to his favourite study, and by the lustre of his abilities, drew the attention of some

of the most learned men in Europe, who encouraged and patronized him in the prosecution of the amiable and interesting pursuit which constituted the pleasure of his life. Botany was but in an indifferent state when he undertook to form a new system, which he effected so excellently that it has immortalized his name; and although it may probably receive improvement from some future naturalist, it is never likely to be superseded.

The studies of Linnæus were not wholly confined to botany; he formed the present classification of most other branches of natural history; and by his judicious arrangements, has rendered the acquisition of the knowledge of nature far easier than it was before his excellent system was invented.

Lucy.

Linnæus for ever! to him we chiefly owe our present pleasures, for since we have learned the elements of botany, we can now enjoy the most pleasing parts of it.

Caroline.

As well as all plants being divided into

twenty-four classes, and one hundred and twenty-one orders, there are discovered two thousand genera, thirty thousand species, and varieties without number. Each has its peculiar habitation, and each adapts the nourishment derived from the earth so differently, that by an unknown cause it produces all the various degrees of flavour, odour, poison, and nutriment, which we find in distinct plants.

Ellen.

Here is William the gardener coming down the walk—I will run forward and see what he has in his hand.

Lucy (quickly overtaking her).

What a singular and beautiful flower! Pray where did you have it from?

William.

This plant has been in the hothouse all the summer, Miss Lucy. It is the Tiger Iris; but the blossom will be over in a few hours, so I was going to put it in the greenhouse.

Ellen.

That is quite right; it will shine there

in all its evanescent glory.—(Then turning to her sisters)—Shall we go to the green-house and look at our plants? The light elegant myranthus wants twining afresh round the window-arch; but I must run in first for some narrow ribbon, to make little festoons for it to hang upon.

Caroline.

Will you be so good as to bring me the "Pleasures of Memory," and I will amuse myself with that in the mean time, on the painted bench under the poplar tree.

"Who would not do any thing for a Caroline?" exclaimed Ellen, as she nimbly ascended the hall-steps, and as quickly returned.

The sisters were soon actively engaged, fresh arranging their plants, cutting off the dead blossoms, and directing their delicate tendrils.

After appearing in deep thought for some time, Ellen thus addressed her sister—"To what class do geraniums belong? I have been examining one very minutely, but I cannot tell—at least I am not quite sure.

Our greenhouse displays such an amazing variety of this beautiful family, that we certainly ought to be perfectly acquainted with it."

Caroline.

With geraniums we arrive at the sixteenth class, Monodelphia; the meaning of this Greek name is, that the stamens in the present instance are always united at bottom into one brotherhood, as it is called, but they are perfectly separate at top. In the preceding classes the stamens, whether few or many, have been entirely distinct from each other. There are three orders in this class, taken from the number of stamens, which you know we have hitherto seen constitute the character of the class itself, but now the number is unnecessary for that, being ascertained, as I have just said, by their union at the base. Do you understand me? Dissect a blossom, and examine it, my love.

The features by which flowers in the sixteenth class are recognised, are, a cup that is permanent, and in many instances dou-

ble; a corolla, composed of five petals, shaped like a heart reversed, the edge of one lying over that of the next in an opposite direction to the apparent motion of the sun; the anthers fixed sideways to the filaments, which are of unequal lengths, the outer ones being the shortest; the receptacle rises in the middle of the flower like a column, the top of it encircled by the upright seed-buds, in the form of a jointed ring; all the pointals are united at their base into one body with the receptacle, though divided at top into as many parts as there are seed-buds; these seed-buds become capsules: the number of the cells depend upon the number of the pointals; the figure varies in the different genera, and they frequently consist of as many seed-coats or arils, each concealing a kidney-shaped seed.

The beauty and variety of the geraniums entitle them to rank high in the esteem of botanists. They are included in the second order, Decandria, having ten stamens. Most of them came originally from the

Cape of Good Hope. We have one numerous genus growing wild, generally known by the name of crane's-bill. The shining crane's-bill is a most elegant little plant, found chiefly in shady lanes; its stalk supports two pink blossoms. The spotted crane's-bill has downy leaves, with five lobes or scollops, and these again divided into three smaller indentures; the blossoms of this plant are of a deep purple; the stigmas, points of the calyx, and leaf-scales, of a deep carmine; in the meadow crane's-bill they are of a fine blue, the petals are entire, and the leaves are wrinkled, and divided into many parts.

Lucy.

Next time we walk I will endeavour to procure specimens of the different sorts of crane's-bill. Does the sixteenth class include no other plants?

Caroline.

Yes; burnet-leaved stork's-bill, consisting of a cup of five leaves, corolla of five red or purple petals, five seeds, each with a curiously-twisted beak, like a corkscrew.

Dwarf-mallow, with its circular and slightly indented leaves: before the art of gardening was brought to its present perfection, the leaves of this plant were produced at table, as those of the cabbage are at present. The common mallow abounds in waste places, or amongst rubbish; it has an upright stem, the leaves have seven sharp divisions, and both foot-stalks and leaf-stalks are hairy. It is often cultivated, and many varieties produced. The marsh-mallow has simple downy leaves, as soft as velvet; the blossom is very much like that of the mallow. It is valued for its medicinal qualities, being useful as an external application, where cooling, softening remedies are necessary. Then, there is the musk-mallow, which is a more elegant plant altogether than any I have mentioned. We can easily procure a specimen of the mallow. Come with me. But first fetch the microscope, that you may examine it more accurately, and I will endeavour to find one in the mean time.

(Ellen goes, and returns with it.)

"Now," said her sister, "look at the dust on the anthers, or top part of the stamina."

Ellen.

How extremely curious! it is toothed exactly like the wheels of a watch.

Caroline.

You perceive then, my dear, that the most minute parts of nature are finished with an elegant nicety, far surpassing the utmost efforts of art; and that they strikingly display themselves as the workmanship of an intelligent artificer.

Although the mallow tribe is common in most parts of England, it is so scarce about Kendal, in Westmoreland, that to find a root of it is regarded as a botanical discovery.

Lucy.

How quickly the morning has passed! it is almost three o'clock. Really the only way to be happy is to be busily engaged. My pretty myranthus quite repays my trouble; for see how charmingly it twines round

the festoons of ribbon which I have hung for it.

"It does indeed, my love," said Mr. L——, who at this moment made his appearance; "and I am gratified by seeing you all so nicely employed. Do the exotics come under your botanical care as well as the indigenous or native plants?"

Lucy.

Sometimes, papa. Caroline has this morning defined the sixteenth class to us; the beautiful geraniums, of which *Fair Ellen* is one, you know, are ranked in it, and (continued she, laughing) you cannot think how highly interested Ellen was!

Mr. L——.

Your intelligent sister has probably told you that the seeds of the geranium surround the pointal at the base; each seed is covered with a distinct seed-coat, peculiar to itself, which, after having enclosed the seed, runs out in the form of a narrow appendage or tail, to the extremity of the style, to which it is slightly connected along its whole length, and which has five grooves or flutes

to receive the five seeds and their appendages.

Lucy.

Sister Caroline explained it to us so far, papa. Will you go on? I like to hear the whole illustration.

Mr. L——.

Each of these appendages has the property of contracting itself into a screw-like or spiral form when dry, and of expanding itself into a right line when moist. In short, it is a spiral string, which lengthens or contracts itself alternately, as often and in such proportion as it happens to become wet or dry. This power first exerts itself when the seed and its appendage becomes dry, in consequence of arriving at maturity, when it gradually separates the seed from its parent plant. The seed thus disengaged is continually contracting and dilating itself, as the weather changes from wet to dry, and from dry to wet, and by this means is kept in motion, until it is either destroyed by the vicissitudes of the seasons, or meets with some crevice in the earth, or

some light porous spot, into which it can easily insinuate itself, and from thence in due time produce a new plant. You will comprehend the particular minutiæ of this curious seed better by inspection than by the most accurate description I could give you. It is principally evident in the seeds of the geranium, *cicutarium moschatum*, though sometimes in other species. Its manœuvres may be seen in a very short time by alternately moistening and drying it. We will take a blossom, and put a little water on the edge of a white china plate, and remove it by turns from the dry to the moist, and from the moist to the dry parts of the plate. I mention a white plate, because on that, I imagine, the fine hairs which display themselves from the sides of the tail, as that contracts, and which acts as fulcra, or feet, to assist and direct the seed in its motions, will be more readily distinguished.

Margaret.

Thank you, dear papa. Here is a fine

large blossom, by which perhaps we can observe this curious piece of natural mechanism.

Botany has indeed opened to us a fund of information ever new; it has taught us to seek for beauties in the apparently most insignificant things. It is at once a delightful and interesting employment.

> 'The little traveller,
> Who toils so cheerfully from flower to flower,
> For ever singing as she goes,'

is not happier than your Margaret, who likewise toils from flower to flower, searching for unknown sweets, and yet unfound delights. We are surrounded by every pleasure and by every blessing.

The fond and affectionate father embraced his children, and they bent their course along the lime-tree avenue towards their home.

The following evening being remarkably warm, the cool shade of a large spreading beech-tree, whose leafy shield no sun could

penetrate, invited the sisters to repair to it. A table was placed before them. Caroline with her work-bag and basket seated herself. Our lively Ellen sung, and with a modest smile the gentle Margaret joined her, whilst the gay young Lucy sketched a view of a neighbouring cot that overlooked the vale. At length Ellen, whose attention and thoughts seemed still to dwell amidst her favourite flowers, stopped, exclaiming —" What a delightful fragrance! it is from these charming sweet-peas. How negligently they are twining around the seat! Sister, will you give me their botanical history?

Caroline.

They are called *papilionaceous* flowers, from *papilio*, the Latin word for a butterfly, which insect they are fancied to resemble.

Ellen.

They do a little—not much, I think.

Caroline.

All leguminous, or butterfly-shaped flowers, are comprehended in the seventeenth class, Diadelphia. The disposition of the

stamens distinguishes the class, and the number of them the orders. If you examine the elegant and wonderful blossom of the pea, you will observe that the calyx is of one piece, divided at the edge into five segments or distinct points, two of which are wider than the other three, and are situated on the upper side of the calyx, whilst the three narrower ones occupy the lower part. The corolla, you see, is composed of four petals ; the first is broad and large, covering the others, and standing, as it were, on the upper part of the corolla, to defend and shelter it from the inclemency of the weather, in the manner of a shield ; by way of preeminence it is called the standard or banner. Now we will take this off, observe how deeply it is inserted on each side, that it may not easily be driven out of place by the wind. The side petals, distinguished by the name of wings, are exposed to view by taking off the banner. These wings are scarcely less useful in protecting the sides of the flower, than the standard is in covering it. Take off

the wings and you will perceive the keel, so called on account of its fancied resemblance to the bottom of a boat; this encloses and preserves the centre of the flower from harm, which its delicate texture might receive from air and water. Now, then, you must examine the contents of this little casket, slip the keel gently down, and you will discover a membrane terminated by ten distinct threads, which surround the germ or embryo of the legume or pod. Each of these threads or filaments is tipped with a yellow anther, the farina of which covers the stigma, which terminates the style, or grows along the side of it. These filaments form an additional defence to the germ from external injuries. As the other parts decay and fall off, the germ gradually becomes a pod or legume. This pod is distinguished from the silique of the cruciform tribe, by the seeds being fastened to one side only of the case or shell, though alternately to each valve of it. We will compare the pod of a pea and a stock together, and you will immediately

perceive the difference. The foot-stalk, which supports this flower, is slender and easily moved by the wind. In wet and rainy weather, the pea turns its back to the storm, whilst the banner unfurls the wings by closing about them, and partly covers them; they perform the same office to the keel, containing the essential parts of fructification. Thus is this flower curiously sheltered and defended from its natural enemies, rain and wind; when the storm is over and fair weather returns, the flower changes its position, as if sensible of the alteration, expands its wings and erects its standard as before.

Ellen.

I see, that when I pull the little keel gently down, there are the ten chives or stamens joining in their bodies so as to make a round tube or cylinder, through which comes out a crooked thread, which is the pointal. I will run a needle down it, and then I shall be able to see the tiny seeds within the legume—little *wee-wee*

things, indeed they are. Are these what make the pea-pods afterwards?

Caroline.

They are. When the blossom drops, the seed-vessel grows longer, and at length hardens as the seeds grow ripe; becomes black and shrivelled, and would burst and shed the seeds if they were not gathered.

Ellen.

I have seen several burst pods of our sweet-peas under the brick wall, with nothing left in them.

Caroline.

It is very common to lose a great part of the seeds whilst they are getting ripe. I believe I have told you that the greater part of leguminous plants are herbaceous: there are also some flowering shrubs, and in warm climates many tall trees. Except the class Triandria, not one is of so much importance to men and animals as Diadelphia. Many of the papilionaceous tribe afford excellent nourishment, and their pods have the name of pulse.

Ellen.

I have heard of persons living on pulse, but I did not before know what it meant.

Caroline.

It is frequently mentioned as part of the diet of abstemious persons; of this kind we eat beans, peas, and kidney or French beans. All the various kinds of clover and trefoil, which are so useful in feeding cattle, belong to this class, as do likewise vetches, saintfoin, and lucern, which are used for the same purposes. These generally compose what are usually, though improperly, called in agriculture, artificial grasses. I told you, some time since, that the natural grasses belong chiefly to the third class.

Ellen.

I have heard papa say, that the leaves of clover form a good rustic hygrometer, being erect in moist, but flat in dry weather. Does it bear pods too?

Caroline.

Yes, very short ones, with one or two seeds in each; but there is a kind called nonsuch, with a very small yellow flower,

which has a curiously-twisted pod, like a snail-shell. Many of these leguminous plants are very weak, and cannot support themselves, therefore they are admirably furnished with tendrils, by means of which they clasp neighbouring plants, and run up them.

Lucy.

Yesterday I observed in the garden that sticks are set in rows with the peas; there is a kind of wild vetch that clings to the hedges in the same manner, and decorates them with its long bunches of blue or purple flowers. Does not the lupine belong to this class? When I gathered mamma's flowers, I tried to make it out, but I could not then; the seeds were some of them ripe, of a whitish colour, mottled with black, and growing in pods or clusters.

Caroline.

They do belong to this tribe; other nations eat them, though we only cultivate them for their colour and gaiety. Tares, which are some of the slenderest of the fa-

mily, do much mischief amongst corn, by twining around it, and choking it.

Ellen.

What is the use of them then?

Caroline.

They are weeds, or noxious plants, with respect to us, but doubtless they have their use in the creation. The stalks are used as food for horses. Some of our papilionaceous flowers are, however, able to manage for themselves—Thorny rest-harrow, so named because its roots are so strongly fixed in the ground, as to prevent the progress of the harrow; its flowers grow in bunches, red, purple, or white; the branches are thorny, and it is altogether a pretty and elegant plant; and gorze or furze, the prickly shrub which covers almost all the common with its yellow fragrant blossoms, are both of this number.

Margaret.

"The vernal furze
With golden baskets hung. Approach it not!
For every blossom has a troop of swords
Drawn to defend it."

Caroline.

The nauseous and pungent juices of some vegetables, and the fragrance of others, are bestowed upon them, in common with thorns and prickles, for their defence against the depredations of animals. Many trees and shrubs supply grateful food to a variety of creatures, and would be quickly devoured, were they not armed with thorns and stings, which protect them not only against some kinds of insects, but also against the naked mouths of quadrupeds. Did you ever notice, as a farther analogy between plants and animals, that the former frequently lose their thorns and prickles by cultivation, as wild animals are deprived of their ferocity by living in a domestic state, under the government and protection of man?

Ellen, I suppose by this time you are pretty well acquainted with the several parts that compose a butterfly-shaped flower. Are you not able to give me some specimen?

Ellen.

There are several bushes of white broom in the shrubbery, and some trees of Spanish-broom by the hermitage.

Caroline.

True. We have also another tree that flowers early, and bears a great many pendent branches of yellow blossoms, which look peculiarly beautiful when intermixed and contrasted with the purple lilacs. Its golden clusters hung sweeping on the ground last June, when the village girls danced on the lawn.

Ellen.

I know it well—laburnum. Cousin Adelaide used to tell me, that when she was at school, her companions and herself welcomed the unfolding of its blossoms with the highest delight, as a symbol that the vacation was fast approaching.

Lucy.

Ah! you know when Rosamond went with her little green watering-pot to water her favourite laburnum, what had happened —I shall never forget laburnums.

Caroline.

Another tree, with delicate light green little leaves, protected by long thorns, and bearing bunches of papilionaceous flowers —there is one by the summerhouse, another in the plantation—do you recollect?

Ellen.

I know what you mean, sister, but I cannot tell its name.

Caroline.

It is the acacia, or locust-tree, a native of America. So you see there are a great variety, from a trefoil that covers the earth, to a large tree. I should not, however, omit to mention the liquorice and tamarind-trees. The former, the root of which is a good friend of yours, Ellen, grows in the warmer countries, especially Spain, but it is cultivated in England. The tamarind is a large spreading tree, that grows in the West Indies, and it is valued for its shade, as well as for the cooling acid pulp of its pods, which are preserved with sugar, and sent over to us.

Well, now do you think you shall be able to discover a papilionaceous flower when we meet with one?

Margaret.

I think we shall, for I suppose they have all the same parts, though variously proportioned—the standard and the two wings—then the keel or little boat—and one pointal in the midst of the stamens.—Shall we take a walk, and probably we may find some more specimens.

"Most willingly," replied her sister. "This is the month in which beans are in blossom. Let us wind down the lane, and through the bean-field. See, the stalks are full of white and black flowers, and how fragrant they are!"

Ellen.

What is this plant, growing in such numerous little tufts by the side of the path?

Caroline.

Fumitory, from *fumaria*, a Latin word for smoke, as it is fancied to appear at a distance like little clouds of smoke rising from the ground. It has but two filaments,

you see, each of them crowned by three anthers. It has a cup of two leaves, and the blossom partakes more of the form of a ringent than of a papilionaceous flower. The upper lip, however, corresponds to the banner, the lower one to the keel, and the cloven mouth to the wings. It bears the seed-vessels in bunches, each containing a single seed. The leaves are doubly winged, with three divisions, and these again are subdivided. The blossoms are produced in long spikes at the end of the stalk, and are, as you see, of a deep pink or purple colour: upon the rocks above the village at Malvern, I have sometimes found them yellow.

Lucy seems waiting in anxious expectation, with an elegant little flower in her hand—it is the milk-wort; though the genus is numerous, only this one species grows wild without culture. I suppose you procured it from the heath, as it is frequently found there, and upon barren spots. It is ranked in the second order, Octandria, on account of its eight stamens, each being

tipped with anthers, which are united at the bottom. The wings may be said to belong to the cup, as they are formed of two coloured leaves which proceed from it. The banner is generally cylindrical; towards the end of the keel, which is hollow, are fixed two appendages, pencil-shaped, with three divisions: many species are without this distinction, which throws the genus naturally into two sections. The flowers of the wild sort are always furnished with this crest; they grow in bunches on herbaceous stems, which are trailing. The leaves are narrow, and the mixture of blue, white, and flesh-coloured blossoms, has a pretty effect.

The plants of the last order are numerous, and bear such an affinity in their general appearance, that it is not difficult to recognise them at first sight. Bird's-foot, found on sandy banks and heaths, is a very tender, delicate, and beautiful plant; stems trailing, from one to eight or nine inches high; leafits, from one to fourteen pair, with an odd one; the standard of the co-

rolla reddish, white and red lines; wings white, with a reddish tinge; keel, a pale straw colour. Crimson grass vetch, whose leaves resemble grass so much, that unless the plant be in flower, it may readily be overlooked. Yellow vetchling, a very singular and rare plant. Pea everlasting, rarely found wild, but the beauty of whose flowers has obtained for it a place in our shrubberies and flower-borders—all belong, with many others, to the third order, Decandria.

But our lengthened shadows remind us that it is time to return home. The next class, Polyadelphia, must be our subject another day.

Seated once more in the cheerful library, our happy party resumed their favourite topic.

"Sister Caroline," said Lucy, "we once learned that leaves are distinguished by different names, according to their forms; that the oil contained in them occasions

their green colour; and that they are supposed to answer the purpose of lungs, by imbibing and giving out moisture.—Will you give us a more definite description of them?"

Caroline.

Of the different distinctions of leaves, according to their forms, above one hundred are enumerated. In all of them, one of the offices is to subtilize and give more spirit to the abundance of nourishing sap, and to convey it to the little buds. Another of the great functions for which the leaves of trees and plants are designed, is that of their foot-stalks nourishing and preparing the buds of the future shoots, which are always formed at the base of these foot-stalks. Leaves, moreover, are designed to shade the buds of the future shoots from the sun, which would otherwise exhale and draw up all their moisture. Air evidently passes in at the leaves, and goes through the whole plant, and out again at the roots. If the leaves have no air, the whole plant will die. Papa can prove this to you, by

an experiment with his air-pump. And plants not only draw through their leaves some part of their nourishment from the air, but the leaves also perform the necessary work of altering the water received in at the roots, into the nature and juices of the plant, and hence it is that the life of the plants depends so much on their leaves.

Lucy.

And what are *deciduous* plants?

Caroline.

When their leaves fall off in autumn, they are called *deciduous*, as the oak, the beech, and the poplar; and *evergreen*, when they are constantly renewed, as in all resinous trees, the yew, the fir, and the box. They are said to *sleep* when they change the appearance of their leaves or flowers at night. They are *indigenous* or native, and *exotic* or foreign. They are *annual*, lasting one year, and reproduced from their seed; or *biennial*, when they are produced in one year, and flower the next; *perennial*, when they last many years, as some shrubs and trees.

Ellen.

Now, then, I have been attentively listening for a long time to your lecture on leaves and so forth, for I confess that I do not like them half so well as my favourite flowers: will you give me the characteristic description of the eighteenth class, Polyadelphia?

Caroline.

Well, my love, I will endeavour to reward your patience. Polyadelphia has its name from the circumstance of the stamens being united by the threads into three or more sets or brotherhoods, as they are called. It contains a few exotics, among which are oranges and lemons. You can procure an orange blossom to examine from the conservatory. We have only a single genus of indigenous plants belonging to this class—the *hypericum*, which has a cup with five divisions, enclosing the seed-bud, and a blossom of five petals, bending from the left to the right, its numerous hair-like threads connected at bottom into three or five sets, like a hair pencil with small

tips; the shafts vary in number, from one or two, to five; the seed-vessel is a capsule, with as many cells as there are shafts. Park-leaves has three pointals, its blossoms are yellow, and succeeded by a berry; the stem is shrubby and two-edged. It is frequent in lanes at the bottom of Malvern Hills; when I was there with my aunt, I frequently met with it. Common St. John's-wort has the same number of pointals, and a stem resembling that I last mentioned, but differing from it in its leaves, which are blunt, and sprinkled with transparent dots, that are sometimes red. The anthers are yellow, and are marked with a small black gland, which will distinguish this species at once; the stigmas are sometimes crimson. Another species has prostrate trailing stems, the flowers growing singly at the base of the leaves, and this is more elegant than either of the others, and very rare. Among hedges, and on rough grounds, is found hairy St. John's-wort, with upright cylindrical stems, and downy egg-shaped

leaves. If Ellen will take a ramble to Primrose-walk, she may, I think, procure a specimen.

Away ran the obliging girl.

In the mean time Lucy requested her sister to give her the botanical description of hemlock—"For," said she, "I saw a person gathering some on the other side of the hedge when we were out, I suppose for the apothecaries. Although it does not belong to the class we are talking about, yet my curiosity is roused by having read, in that delightful book, 'Grecian Stories,' the account of the excellent philosopher, Socrates, who received the cup of hemlock when it was presented to him, not only with perfect composure, but even with cheerfulness; so I brought some home that you might explain its nature to me."

Caroline.

As to its qualities, my love, I will only reply as Sir Wiliam Jones's mother used to do to him—'Read and you will know.' I will tell you, however, that it belongs to a tribe of plants called *umbelliferous*—one

which contains both food, physic, and poison. Since we have not examined them before, I will describe the hemlock more closely now. You see this tall hollow stalk, which divides into several branches, from each of which spring spokes or rundles, as they are called, of flower-stalks.

Lucy

Oh yes; they are like rays from a circle, the spokes of a wheel, or the sticks of a parasol, or umbrella.

Caroline.

They are called *umbels*, which has the same derivation. If you pursue one of these rundles or umbels, you will find that each stick or spoke terminates in another set of smaller stalks, each of which bears a single little flower; although it is so small, you will be able to distinguish that it is divided into five petals, and furnished with five stamens, and two pointals in the middle. The pointals are succeeded by a sort of fruit, which is a twin-seed joined in the middle, and which you may perceive in this rundle that is past flowering. I will

divide one of them into two. This is the structure of the umbelliferous tribe.

Lucy.

Ah! it belongs to the fifth class, Pentandria, and to the second order, Digynia. Now for the leaf. You have been so good as to explain the use of leaves, that I should like a particular description of this.

Caroline.

From this rib in the middle, you see, spring smaller leaves, set opposite to each other, and from the rib of each of these spring others, which themselves are divided also; these are called doubly or trebly pinnated leaves, and most of the umbelliferous plants, but not all, have leaves of this kind.

Lucy.

Carrots and parsneps, parsley and celery, have—have they not?

Caroline.

Yes, they are therefore ranked in this family; but hemlock is known by its peculiar smell, and other circumstances, that

you will be able to understand when you have compared a number of the tribe.

Look at little Frederic playing on the grass yonder. How busily he is employed!

"Oh, he is trying to blow off the dandelion feathers at a blast! I will run and fetch one of those 'staring courtiers of the sun,' for so papa calls them, and see if we can make no better use of it," said Ellen, as she threw open the window that looked on the lawn, advanced towards her little brother, and soon returning, examined one full of seeds with her magnifying glass.

"What a beautiful thing!" exclaimed she; "how exact! The seed at the bottom is like the point of a barbed dart; from it springs a slender hairy shaft, crowned by a very elegant spreading plume—it is a complete arrow of nature's manufacture. I suppose the use of it is to set the seeds a flying with the wind, and they therefore sow themselves wherever they happen to light.

Caroline.

They do; this is one of nature's contri-

vances for dissemination, or scattering of the seeds of plants, which makes them reach all the proper places of their growth. You know there are many furnished with the same winged or feathered seeds. Groundsel, thistles, rag-wort, and many others, belong to a very extensive class; they are called *compound-flowered* plants, and are generally bitter, and some of them possessed of many specific virtues, which render them highly useful.

Lucy.

Yes, yes, you are quite right in saying they are highly useful, for the groundsel is a charming treat to my favourite Rafy. Linnets and goldfinches too—how often we see whole flocks of them picking amongst the thistles! as well as furnishing food by their seeds, they make a fine warm down for lining their nests; and Frederic's little white rabbit eats sow-thistles, and is very fond of them.

Caroline.

To the farmer, however, they are generally troublesome weeds. Burdock and

yarrow overrun his hedge-banks. Hawk-weed and dandelion fill his meadows. Wild camomile, corn-marigold, and ox-eye, choke up his corn-fields; and the tall and branching rag-wort encumbers his pastures.—These have generally a bitter nauseous taste, so that no cattle will touch them; daisies are, I believe, the chief exception. A very small proportion of plants in this class are used for food. The artichoke, though, of which Margaret is so fond, may be included; it forms a very singular article of diet, for the part chiefly eaten, called the bottom, is the receptacle of the flower, upon which the choke or seeds with their feathers are placed. I have heard that some of the largest species of thistles may be dressed and eaten this way, and that the scales of the cup are as good as artichokes. That grand ingredient in sallad too, lettuce, is of this class, and so also is endive.

Margaret.

I think there are some garden flowers belonging to this family, especially the

autumnal ones. The sunflowers of various kinds, which are the largest we have. Marigolds, both common, French and African; asters; china-asters; golden-rod; crysanthemums, and lavender-cotton. But very few of them have an agreeable scent, and their shape is not particularly pleasing; they are mostly of gay colours, and make the garden look showy when the more delicate flowers are withered.

Caroline.

These are all compound flowered plants; they are rather a difficult class to make out botanically, though easily known from each other by sight. If you are inclined, we will walk out, and I will then give you the general account of the nineteenth class, Syngynesia, to which all we have now mentioned belong.

The sisters, as usual, were soon equipped in their hats and spencers, and affectionately joined arm in arm; they pursued their way through some corn-fields, whilst Caroline thus resumed her discourse.

"It is necessary to acquire accurate

ideas of the structure of the parts which compose the different kinds of compound flowers, as well as the distinction of the six orders, into which the class is divided. The essential character of a compound flower does not consist in the composition of many florets, but in the union of the tips at top into a cylinder, and a single seed being placed upon the receptacle under each little floret. Take one of those little flowers, which every one knows by the name of daisy, and you will be surprised when I tell you, that this flower, so small and delicate, is composed of between two and three hundred other flowers, all of them perfect; that is, having each its corolla, germ, pointal, stamens, and seed; in short, as perfect in its species as a flower of the hyacinth or lily. You perceive that all of these little flowers are pressed and enclosed in one common calyx. So, considering the whole daisy as one flower, we give it a very significant name, when we call it a compound flower. Sometimes the flowers of this class are enclosed by one cup, which is

made of a number of scales lying upon each other like tiles on a roof. Sometimes this cup, calyx, or empalement, consists of a single row of scales or leaves, divided to the base, that during the progress of the fructification, it may open or close without being torn. The surface of the receptacle is of different forms, concave, pyramidical, flat, or convex, and is either smooth, full of little holes, or beset with small soft upright scales, which separate the florets placed upon it. A floret is a monopetalous flower, commonly regular, with the corolla divided at top into four or five parts; the five filaments of the stamens are fastened to the tube of this corolla; they are united at top into a little round tube, through which passes the shaft of the pointal, the summit mostly rising above the floret, and terminating in two curling forks. The floret and pointal both rest on the seed-bud, which lengthens as the seed becomes ripe; if it be a naked seed, it falls to the ground when perfectly mature; but if like a little arrow, or crowned with an egret of feathers,

it wafts its way through the air to some distant spot, and there produces a new plant the following season. This downy substance, or plume of feathers, is either sitting close to the seed, or fixed on the top of a pedicle like a small pillar. In the thistle, the florets are tubular or funnel-shaped throughout; in the daisy, the central ones which form the disk, as it is called, are tubular, whilst those in the circumference have a broad strap on one side, which altogether compose the rays of the flowers, whence this sort are called radiate. In radiate flowers, the disk is often of one colour and the ray of another. The name Syngynesia, is derived from two Greek words, signifying that the tips of the stamens grow together; whence Linnæus has taken his distinction of the whole class. The more you examine specimens of the natural tribe we are now considering, the more you will admire them, as they will all afford fresh proofs that these parts of organized nature, which might otherwise appear trifling and

insignificant, are contrived with the most perfect wisdom.

" Go mark the matchless workings of the Power,
That shuts within the seed the future flower,
Bids these in elegance of form excel,
In colour these, and these delight the smell;
Sends nature forth, the daughter of the skies,
To dance on earth, and charm all human eyes."

Ellen.

I know those lines perfectly—our favourite Cowper's.

Caroline.

I should add that the calyx has generally the property of opening when the flower expands, of closing when the florets wither, in order to confine the young seed, and to prevent it from falling before it is ripe, and lastly of opening again and turning quite back, thus leaving a passage for the seeds to escape. The dandelion was in this state when Frederic was blowing it.

Margaret.

Will you now explain to us, how the six orders in this class are distinguished?

Caroline.

The first order is called Polygamia

æqualis. The word Polygamia is a family name, applied to all the orders except the last, and implies that there are many florets enclosed within one common calyx. The peculiar name æqualis, means regular or equal, and infers that all the floscules are similar, and all furnished with stamens and pointals.

Lucy.

Then the dandelion belongs to the first order.

Caroline.

Yes: and succory and goat's-beard—this last is one of Flora's time-keepers; the blossoms yellow, expanding early in the morning and closing again before noon. Ox-tongue, also, this has a double cup and a yellow blossom.

The numerous genus of hawkweeds—all the thistle tribe; though they are so commonly disregarded on account of their uncouth harsh appearance and their abundance, yet they are not destitute of beauty on farther inspection, nor void of utility;

for nothing would grow for years on clay newly thrown up, were it not that the seeds of thistles fix and vegetate there, and as they grow up, shelter other plants which arrive at maturity under their protection. An empalement beset with thorny scales, and a receptacle with hairs between the seeds, characterize this intractable race. The leaves of many of the species run along the stem, and forbid our near approach. In the second order, Polygamia superflua, all the florets of the disk or centre of the flower have stamens and pointals; those of the ray or circumference have only one pointal; both of them produce seed.

Ellen.

Ah! the daisy is a familiar instance. I remember that you told me it is called a radiate flower. Will you give us some other example?

Caroline.

You are right in mentioning the daisy, which enamels every meadow with its vernal and autumnal flowers. The yellow flowers of the corn-marigold follow the sun

in a remarkable manner, give a brilliancy to the fields in tillage, and please the eye of the passing traveller. Do you recollect at the village-wake, we were amused with observing that every poor man had a sprig of southern-wood in his coat, a plant belonging to this order? it has leaves with many clefts, and long tender shoots proceeding from its trailing stems. Wormwood, which is known as an aromatic bitter, is also included in it; the blossoms are brownish, a colour not very common among flowers; it is distinguished by its upright herbaceous stems; the flowers are rather globular and pendant, and the leaves are compound with many divisions.

Lucy has trampled among the corn to procure a flower—happily it is a specimen of the third order, Polygamia frustranea. This order contains those whose florets in the disk, or centre, are perfect, and produce seed, whilst those of the ray are imperfect, and therefore frustrate or barren, from which circumstance it takes its name. This is the bluebottle or corn-

flower, its corolla is of a beautiful blue; we sometimes find it purple, white, violet, or variegated with different colours; but in all, the scales of the cup are fringed, the upper leaves are narrow and entire, but those nearer the ground are broader, and toothed at the edges. Great knap-weed has leaves with winged clefts, and bears its blossoms on long naked fruit-stalks; another species called horse-knops, has skinny ragged cups, with spear-shaped leaves, and angular branches: there are two other species with cups doubly spined, one of them called star-thistle, has trap-shaped toothed leaves, with winged clefts, a hairy stem, and white blossoms; it is found in barren meadows and by the road-side. St. Barnaby's thistle is known by its spear-shaped leaves running along the branches; those nearest the root are lyre-shaped and winged. The fourth order, Polygamia necessaria, contains chiefly marigolds and cudweeds. The florets in the disk, though apparently perfect, are not really so, and therefore produce no seed; but the fertility of the

pistilliferous floscules in the ray, compensates for the deficiency of those in the centre of the flower. The cudweed has a naked receptacle, seeds without down, and florets with pointals fixed amongst the scales of the calyx. Barren pastures and sandy corn-fields produce the different species, which are chiefly distinguished by the form of the flowers; in one kind they are round, in a second conical, and in a third awl-shaped. The globe-thistle is a beautiful example of the fifth order, Polygamia segreta; it has many floscules enclosed in one common calyx, yet each of the floscules has one appropriate to itself.

Ellen.

I believe I quite understand all you have told us so far. Now for the last order of Syngynesia.

Caroline.

The sixth and last order is called Monogamia, and consists of plants with simple, *not compound* flowers, remember: it is this peculiarity distinguishes it from the rest,

but at the same time you must learn its classical character; it consists in having the stamens united by five anthers, the appropriate badge of the class, for it differs widely from the natural family of compound flowers, which I have explained to you in the preceding orders. The flowers are simple; that is to say, one flower is enclosed in one calyx, like those of the other classes. This order will gratify my gentle Margaret, for a fragrant flower is included in it.

> "Shedding her lasting perfume, but for which
> We had not known there was a thing so sweet
> Hid in the gloomy shade."

It is universally acknowledged the emblem of modesty, and much valued and admired for its odoriferous fragrance, perfuming the banks and hedges in spring. It is furnished with a cup of five leaves, an irregular corolla of five petals, the uppermost petal terminating at the base in a horn or spur, performing the office of a nectary or honey-cup, and a capsule of one cell and three valves above the receptacle, or

enclosed by the calyx; it has no stalk but that which supports the flower and the suckers which creep from it; the leaves are heart-shaped, and the blossom darkish purple; though there is a variety with white flowers: the colour as well as the number of petals is varied by cultivation, so that this vernal favourite is seen in our gardens under many appearances.

Can you give me its name?

Lucy.

I think it is the violet, you have described it so accurately.

Ellen.

Oh yes! I am sure it must be. Margaret's favourite too. Do you not recollect how beautiful Primrose-bank looked in the spring, covered with the meek soft-eyed primroses and the modest retiring violets?

Lucy.

Had it the power of thinking, it would be rather abashed I fancy, in taking a station among its noble friends, the sun-flower and all the rest of them.

Margaret.

I have found an heart's-ease, and I should suppose it to belong to the same class and order; it has props with winged clefts, and a globular, open, hollow stigma, fringed towards the bottom; the stems are three cornered and spreading with oblong gashed leaves; its blossom is a union of three colours, purple, yellow, and light blue

Caroline.

And that sometimes procures for it the name of tricolor; the particles of the farina, when magnified, appear angular, but become round when wetted with water; indeed this is the common effect of moisture on the dust of flowers.

Lucy.

I have thought of another plant which is probably of this family—a sort of wild balsam with egg-shaped leaves, and fruit-stalks supporting several yellow blossoms, and the stem is swelled at the joints.

Ellen.

I remember. The gardener brought one to shew us; he said it was vulgarly

called touch-me-not, though properly a balsam found wild in some of the northern counties. Little Frederic was with us, and he accidentally touched one of the seed-vessels, when it suddenly burst open with so much force, that it made him almost jump out of nurse's arms. You cannot think how it made me laugh; he amused himself with it for an hour or two after, until he had made all the seeds *pop* out of their stations.

Lucy.

And he employed me too for an hour or two after, for unfortunately we happened to be by my garden, and it was soon completely covered with these little *touch-me-nots*.

Caroline.

They are a species of balsams, with which you are also well acquainted, for there are some on the stands in the hall. The genus is characterized by a calyx of two leaves, a five-petalled corolla, the bottom of which is received into the honey-cup of one leaf, shaped like a hood, and

from the elasticity of which, the seeds when ripe burst forth upon the slightest impulse.

We have now proceeded through the extensive class, Syngynesia; the principal difficulty in botany lies with respect to its orders, which I hope, however, you will soon conquer. You must follow the flowers from before their expansion to the full maturity of their fruit, and in this succession you will see transformations, and a chain of wonders, which will fill you with continual admiration.

The dew begins to rise thickly in the valley, and we must return through the village, so let us bend our steps that way.

Ellen.

I am sure if what we have learned to-night be the grand difficulty, no one can complain that botany is a laborious, ceaseless study. Will you, as we walk, give us a description of the next class? I am all impatience to know what specimens we must procure for it.

Caroline.

Botany is a branch of natural history

that possesses many advantages; it is now generally studied, and considered as a necessary part of an accomplished education. Besides all this, how much enjoyment we derive from it! with how much more delight we gather every plant and every flower! It teaches us at once to think and to reflect, and introduces us to the ever new and charming volume of nature.

It will be better, my love, not to overburden your memory with too much at once; we will defer the next class till tomorrow, then again I will endeavour to oblige you.

With this assurance Ellen gently pressed her sister's hand, and they proceeded through the little green gate of the shrubbery.

Caroline, Margaret, Lucy, and Ellen, were early assembled in the library the following morning, when our young botanist, ever ready to open the conversation, began.

"Now, sister, for the twentieth class,

Gynandria. I have waited in anxious expectation, without asking one single question since last night, I assure you. I hope there are some very pretty flowers in it to reward my *great* perseverance."

Caroline.

I fear, my little friend, you will have to exercise your patience still longer, with regard to the most numerous genus in this class, the orchis, known from the rest by its horn-shaped honey-cup; it flowers early in the spring; however, I can give you its characteristic description.

Lucy.

That I think is the flower that formed such a pretty contrast to the cowslips in the children's garlands on the first of May, it is of a fine purple colour.

Margaret.

I remember too papa's bringing one, called a bee-orchis, from its blossoms bearing such an admirable resemblance to a bee.

Caroline.

The twentieth class, Gynandria, is dis-

tinguished from all others, by the circumstance of having the stamens fixed upon the shaft of the pointal itself, or upon a receptacle that stretches out into the form of a shaft. The orders are marked by the number of stamens in each flower.

Ellen.

I can easily remember this distinction, for all that we have hitherto observed have had their stamens and pointals *quite* separate and independent of each other.

Caroline.

The structure of the orchis-flowers is very remarkable as well as that of the root; each will deserve your particular attention. In some species the root is composed of two solid bulbs, in others it consists of a set of oblong fleshy substances, tapering like fingers. I must give you an accurate account of the plants in this family, for from the unusual situation of the parts of fructification, the blossoms possess a very singular appearance. The seed-bud is oblong, and always placed below the flower,

twisted like a screw; a sheath supplies the want of a proper calyx; the corolla has five petals irregularly shaped, the two innermost uniting over the others in the form of an arch; the honey-cup forms the lower lip, and fills the place of the pointal and the sixth petal; to the inner edge of the nectary adheres the shaft, which with its stigma you can scarcely discern without your magnifying glass: the stamens are very short, and are also fixed to the inner rim of the nectary; the tips have no covering, their texture is something like the pulp of an orange; two small cells opening downwards enclose them, and almost conceal them from observation. The spiral germ is converted into a seed-vessel of three valves, opening at the angles under the keel-shaped ribs; within is one cell, containing many little seeds, like saw-dust, growing upon a receptacle upon each valve.

Lucy.

I shall be very glad when the orchis makes its appearance again in the coppice. We shall examine one with double interest,

now we know how extremely curious it is. To which order does its belong?

Caroline.

To the first order, Diandria, from having two stamens: the common orchis is known by its nectary, placed like a horn behind the flower. The butterfly-orchis is so called from its expanding petals; its greenish white blossoms emit an agreeable scent, particularly in the evening; the roots are double undivided bulbs. The pyramidal orchis is an elegant species; the spike of flowers very beautiful, and of a brilliant purple, the stem a foot or eighteen inches high; it is found in meadows and dry pastures. There are two kinds very common, called male and female orchis. The aromatic and spotted orchis grow generally in moist meadows; the stem of the latter is solid, and the leaves covered with black spots, whilst the broad-leaved orchis has a hollow stem and leaves nearly without spots. Margaret spoke of the bee-orchis; it is mostly found amongst grass on chalky soils; its beauty will amply repay the trouble of

searching for it. The lip of the bee is divided into five lobes, bent backwards; the outer petals are large and spreading, of a purple colour, the two innermost green; the lower lip of the nectary is cut into three parts, and is shorter than the petals; the colour is brownish purple, mixed with yellow; the upper lip is the longest, narrowing to a point, and is green; the filaments are long, and the anthers very large; the seed-bud exceeds the petals in length, but does not equal that of the leaves. The fly-orchis has the nectary cloven into four clefts; the wings and helmet are greenish.

Ellen.

Indeed, Caroline, you have raised my impatience still more. How much delighted I shall be to search for these curious flowers! Are there not any I could find now?

Caroline.

Ladies'-slipper has egg or spear-shaped leaves, and fibrous roots; the stem rises about a foot high and is leafy; the purple

petals are set off to advantage by the light yellow honey-cups.

Lucy.

Ah! I know the flower you mean. I have often gathered it, and fancied the nectary in the form of a slipper, which, I suppose, has given rise to its name. Poor Ellen is hoping for another—will you oblige her?

Caroline.

Common tway-blade has an honey-cup longer than the petals; it hangs down, and is keeled on the back part; it is the keel that in some species takes the form of an insect so exactly, as to appear real at a distance. The stem of triple-ladies'-traces is somewhat leafy, the flowers are placed spirally, but pointing one way; the lip is not divided, but only notched with a small scollop; the three outer petals are glued together; it flourishes in barren pastures, and seldom rises more than six or eight inches. The unusual figure and beauty of many of these plants will afford you a fund

of entertainment in the next botanical ramble we take, as we may probably procure some of them.

Margaret.

We had better walk in the evening, I think, for it is very warm now. I will finish painting mamma's card-racks this morning, and you, Ellen, can go on with the border of roses.

Ellen.

" As erst in Eden's blissful bowers,
Young Eve survey'd her countless flowers,
An opening rose, of purest white,
She mark'd with eyes that beam'd delight;
Its leaves she kiss'd—and straight it drew
From beauty's lip the vermeil hue."

This is the origin of the red rose—I met with it yesterday—is it not pretty? I knew it would just suit you, Margaret.

Lucy.

But, amidst all your *grand* poetry, have you not forgotten the grotto? Do you recollect that papa said, if he had leisure today, he would go with us into the wood to fix on some sequestered spot for it; he will be our architect, and we shall be most de-

lightfully employed, in the mean time, collecting small stones, sea-weeds, shells, and moss, to line it with. Where do you think will be the best place for it?

Margaret.

You know I am always for retirement; but my favourite spot is one corner of the shrubbery, in the little valley overlooking the rivulet. We must have a narrow winding path leading to our romantic temple; it is to be supported by rustic fluted pillars, and trellis-work arches, with a painted glass window; it will be just large enough to contain the *four sisters,* so I think it must be dedicated to "*l'amitie,*" continued she, affectionately smiling on the remaining trio.

Lucy.

We must collect a great deal of moss to line it with.—Here comes dear papa!—I love dear papa, for he always is good, as little Frederic so often says.

Mr. L——.

Well, my young friends, your darling

topic seems not yet exhausted. Pray what class is your subject to-day?

Ellen.

We are arrived at the twentieth class, Gynandria, now, papa, although just as you entered the room, we were settling where the grotto should be erected, and wishing for your advice; but on no account shall we neglect our botanical pursuits.—The orchis genus, tway-blades, and ladies'-slippers, belong to our class this morning.

Mr. L——.

With stamina inserted on the pistillum. Hitherto your attention has been confined to such flowers only as are termed complete, having both stamens and pointals on the same flower. But the next three classes will furnish you with examples of those which have only the one or the other on the same flower.

Ellen.

Will you tell me, papa, where a singular plant we have often seen in the woods (under the vulgar name of lords and ladies), ought to be placed?

Mr. L——.

This extraordinary genus has perplexed botanists where to place it. Its proper name is *arum.* It makes its first appearance under hedges, in spring, by a very large oblong leaf, in the centre of which is a club-shaped fruit-stalk, or receptacle, naked on the upper part, but covered with seed-buds at bottom, and with anthers in the middle, so that the filaments are unnecessary; as the plant approaches to maturity, the sheath opens and unveils the club, which varies gradually from a yellowish green to a fine red purple; when this withers, it is followed by a head of round red berries, which are acrid and pungent, as is the whole plant. It is generally put in the third order of Gynandria.

Margaret.

Papa, do all the flowers of different countries possess the same parts of fructification, and is the same botanical system employed in other parts of the globe, capable of producing plants?

Mr. L——.

Yes, my love. The flowers of plants Linnæus very properly made the sole foundation of his beautiful system of botany. Being the same in all parts of the world, the classification founded upon them affords a kind of universal language, as it were, to botanists, whereby they can no longer mistake each other's meaning, as has unfortunately been the case, more or less, with almost all former botanical systems.

Ellen.

What does the word *botany* mean, papa?

Mr. L——.

Botany (from a Greek word, signifying an herb or plant) formerly implied a knowledge of the nature, uses, and cultivation of plants; but as a modern science, botany chiefly applies to the classification of plants, or that systematic arrangement by which, from general marks or characters, the botanist is enabled, first to trace the class, next the order, then the genus, and last of all the species to which any plant he meets with belongs. The system invented by

Linnæus you well know to be the simplest and most decisive of them all.

Ellen.

How must we investigate the *genus* of a plant?

Mr. L——.

We must first consider its *essence.* Do not be alarmed. The essence of a plant, says Linnæus, consists in the fructification; the essence of the fructification in the flower and fruit; the essence of the flower consists in the stamens and pointals, and the essence of the fruit in the seed. Hence he makes the flower and fruit the foundation of his generic distinctions. These are generally composed of seven parts—the calyx, the corolla, the stamina, the pistillum, the pericarpium, the semina, and the receptaculum; and the presence or absence, the number, figure, proportion, and situation, of the several parts, constitute the genus.

Ellen.

How must we investigate the *species* of a plant, papa?

Mr. L——.

The genera includes a great number of species, distinguished by the difference of the root, the trunk, the branches, the leaves and supports, yet all agreeing in the essential generic character. They are called by trivial names, expressive of the difference of some other circumstance, added to the generic name. To investigate the species, therefore, it is necessary to understand those differences, and to be acquainted with the names by which they are expressed.

Now, if you will put on your hats, I will accompany you to the wood. As we walk, Caroline shall describe the next class, for probably, in the shrubbery, we shall find some examples to gratify my Ellen's curiosity.

Attended by their father, the interesting group descended the steps that led to the lawn, and proceeded arm-in-arm down the lime-tree walk, whilst Caroline thus continued the conversation:—"The twenty-first class, Monoecia, which now claims our

attention, differs, in a very essential manner, from any we have yet observed ; we are no longer to look for perfect flowers within the same empalement; but may expect to find the blossoms of an individual plant varying in character, some bearing stamina only, and others pointals only. The former produce no seed, but the pistilliferous flowers produce a germ furnished with seeds. Ditches, stagnant waters, and ponds, nourish most of the stoneworts ; the lake-weeds are also confined to the same situations ; the stigmas are the most remarkable peculiarity in these plants ; they are broad and expanding, forming a kind of cup.

Mr. L——.

This class contains many species, but as you cannot gather them without wetting your feet, it will be unnecessary to explain their minute distinctions. The very numerous tribe of sedges, having three stamens, belongs to the third order, and commonly grows in bogs and marshy places; both kinds of flowers are borne on catkins, con-

sisting of scales, each containing a single flower; neither kind has any corolla; the fertile flowers have a three-toothed nectary, which is puffed up, and within is the triangular seed-bud, a very short shaft with three stigmas; and, lastly, a three-cornered seed. The size, lofty, and indeed graceful appearance of the great pendulous carex, or sedge, with its long spikes, will at once point it out, when you are acquainted with its character. The thread-shaped spikes of the slender-spiked carex, drooping whilst in flower; its two summits, and its compressed flattish capsules, entire at the end, keep it distinct from every other species. There is also the vernal, the oval, the spiked, great prickly, turfy, hairy, and cyperus carex.

Lucy.

Unfortunately we cannot procure an example of either; so will you give us some other specimens?

Caroline.

If you will search on the hot-bed in the garden as we return, you will find by the

blossoms of the cucumber and melon, that some bear stamina only, others pistilla only, on the same root.

Ellen.

Then the plants contained in this class are not hermaphrodite, but adrogynous.

Mr. L——.

True. Although this class is not very extensive, it is extremely interesting: several stately trees are included in it. The majestic oak, the thick-spreading hazel, the beech, whose widely spreading branches shelter you in your favourite seat; the hornbeam, which forms so pretty an ornament to our lawns and shrubberies; its different sorts of flowers are produced in separate catkins; both have a separate flower in each scale; the number of stamens varies, though generally about ten; the fertile flowers have two germs, each bearing two pointals; the catkins growing very large, enclose the seed at the base of the scales; the leaves, you see, are wrinkled, oval, and pointed, being sharply indented at the edges. Another tree, by the perpetual ver-

dure of its oval, thick, and glossy leaves through the winter, contributes not a little to the beauty of plantations and pleasure-grounds during that desolate season. Both kinds of flowers proceed in bunches together from its buds; the barren blossoms have a cup of three leaves, a corolla of two greenish white petals, and the rudiment of a seed-bud without either shaft or summit; the fertile flowers have a four-leaved calyx, a three-petalled corolla, three pointals, and a three-celled capsule, with three bills, opening as a spring three ways, each cell containing two seeds. There are many varieties, but they all belong to one species.

Lucy

Ah! I guess to what papa alludes—his favourite box-tree—is it not?

Mr. L——.

Right. The yew and fir too, independent of their value, relieve the brumal landscape by their perennial green. The birch, the chesnut, the filbert, also adorn our shrubberies.

Ellen.

The gloomy darkness of its foliage forms a fine contrast with the rest of the trees in the shrubbery.

Mr. L——.

There are yet some smaller plants. The bur-reed and the reed-mace have a near affinity to each other. The elegant burnet, whose leaves resemble those of the rose: and arrow-head, whose flowers grow in whirls, beautifully white, with a purplish tinge at the claws of the petals. I must not forget to mention the stinging-nettle also. Caroline, will you describe it?

Caroline.

The stameniferous flowers have a cup of four leaves; instead of the corolla, a honey-cup is placed in the centre of the flowers; the pistilliferous flowers are not always on the same plant, but are sometimes seen on distant ones; they have a cup formed of two valves, which closing, supplies the place of a seed-vessel; they have no corolla at all.

Lucy.

I have often, in the wood, felt the disagreeable effects of their stings; but to make amends, I amused myself one day with examining them through my magnifying glass. They resemble the stings of insects in shape, long, tapering, and finely-pointed. But I do not exactly comprehend how such little things can inflict so much pain.

Caroline.

Notwithstanding their minuteness, they are hollow, and convey a poisonous fluid, which is contained in a small bag at the bottom of the sting; upon the sting meeting with resistance, it presses upon this *wee wee* bag, and acts like a syringe.

I think papa mentioned the fir, as belonging to the class of which we are speaking. The Scotch fir is the ornament of the Highland mountains, where it is both scattered and formed into natural forests of many miles in extent. This tree supplies us with deal. The poor inhabitants of

Norway and Sweden convert its bark into bread.

Ellen.

Papa once shewed us cloth made of the bark of trees, but I never imagined it could be turned into bread. How do they do it?

Caroline.

They choose a tree whose trunk is even, for these contain the least resin, and strip off the bark in the spring, because it then separates most easily; this they first dry gently in the shade, then in a greater heat, and reduce it to powder: with this powder they mix water, and knead it into bread; this bread they eat not only in years of scarcity, but at other times, from supposing that a long disuse might render it disagreeable. Their children are very fond of the fresh bark, in the spring season, either shaved with a knife, or grated with a rasp. The young shoots distilled, afford a fragrant essential oil. So, my smiling girl, you will allow me to think that the twenty-first class, Monoecia, ought to be highly esteemed.

Mr. L——.

Any thing, you know, can be obtained by industry, patience, and perseverance, which has been happily exemplified in the progress you have hitherto made. You must now summon up all you can, as the following class will give you some trouble, by obliging you to examine flowers of the same kinds upon different plants. The only distinction between the last class and the twenty-second, which we are now going to investigate, consists in the disposition of the respective kinds of flowers. In the former class, both kinds were produced on the same plant; but in this, Dioecia, they must be sought for, as I said before, on different plants of the same species.

Botany, like all other sciences, has its elements, which it is necessary to learn perfectly; I am glad to perceive it is become so interesting as to enable you to overlook the little difficulties, and to supply a source of perpetual amusement and information.

Ellen.

If you knew, papa, with what delight I examine the fructification of every fresh flower I meet with, you would not fear my patience failing now; on the contrary, seeking for many specimens will render it still more interesting.

Will you be so good as to tell me the names of some plants, included in the twenty-second class?

Caroline.

We will wander round by the fish-ponds, that we may have an opportunity of examining the blossom of the willows, which are contained in it. They belong to the first order. The number of stamens is not always the same in the different species; in some there are three or five of unequal length. Two is the number which generally prevails and distinguishes the order; the genus contains many species; each kind of flower grows on a scaled catkin, with a single flower in each scale, which has no corolla; the barren flowers have a very small nectary in their centre; in those

which are fertile is an egg-shaped seed-bud, tapering into a shaft, hardly distinct from the germ, and ending in two upright summits; the capsule has one cell and two valves, enclosing many small downy seeds. The rose-willow is a tall shrub; all sorts of basket-work are made of its long, slender, and flexible shoots. The weeping willow is well known to the lovers of picturesque beauty, from its long, slender, pendant branches, which render it an admirable accompaniment to a still retired piece of water, with the melancholy character of which it is perfectly in unison. The graceful poplar waving its tapering branches; the trembling poplar or aspen-tree, whose leaves vibrate and shake with the lightest breeze; the hardy juniper and the abele-tree, will all claim a place in Dioecia.

Mr. L——.

The berries of the juniper sometimes appear in an uncommon form, the leaves of the cup grow double the usual size approaching, but not closing, and the three

petals fitting exactly close. Gin is impregnated with them; and gum sandrach, more commonly called pounce, is the product of the juniper-tree.

Margaret.

We are well acquainted with the hop, which twines itself so negligently around the arbour; I have observed that that has barren flowers and a cup of five leaves; whilst the hop by the hermitage has fertile ones, and is one-leafed, expanding obliquely and entire; each of these is furnished with two pointals and one seed, and the whole is surrounded by a leafy empalement; neither has any sort of corolla, and what we are accustomed to call a hop, is only a cluster of these little flowers put together.

Ellen.

Then the hop is also ranked in the class Dioecia. Now, whilst I think of it, I will ask you, papa, to what class a curious plant belongs that I saw in the hedge last winter, as I was walking up the lane leading to the heath. It was a great bunch of something green, bearing slimy white ber-

ries, and it grew, not on a tree of its own, but on an old crab-tree.

Mr. L——.

Ah! that was the mistletoe, and it belongs to the very class of which we are speaking. It is a plant of great fame for the use made of it by the Druids, in their religious rites and incantations. It is one of those plants which do not grow in the ground by a root of their own, but fix themselves upon other plants; whence they have been humorously styled *parasitical*, as being hangers-on, or dependents. The mistletoe of the oak, the Druids particularly honoured.

Ellen.

But of course, papa, the mistletoe must by some means or other have been produced. How then comes it to spring from old oaks, crab-trees, and so on?

Mr. L——.

You do right to reason, my dear girl, and to request an explanation of what you do not comprehend. The seeds of this plant are supposed to be propagated by

birds, which swallow them whole and drop them on branches of trees, where they vegetate by insinuating the fibrous parts of the root into the woody substance of the tree.

Ellen.

Thank you, papa. Before we proceed to the next class, I have a few questions to ask you.

Margaret requested you to tell her whether the same botanical system is employed in different parts of the world—now, you know, we are but little acquainted with the interior parts of Africa, America, New Guinea, New Zealand, and the numerous small islands of the Southern Ocean, as well as many other countries. Do you suppose plants grow and vegetate *there* as they do *here*, and that they possess the pointals, stamina, and various parts as ours do?

Mr. L——.

The vast coasts of New Holland and the island of Otaheite are said to have a bota-

ny peculiar to themselves. The number of plants hitherto ascertained must be comparatively small, when we consider how little is known of the vegetable productions of the globe. All plants that we do know of, grow in the same manner: the genial warmth of the sun, the refreshment of rain, the same soils, appear to suit their respective species; and upon a superficial glance they seem to have the same common parts. It is to be wished that our conquests in Egypt, and in Ceylon, an island of infinite produce for the naturalist, may lead to many curious and useful acquisitions in the vegetable world.

"Another Flora there of bolder hues,
And richer sweets beyond our garden's pride,
Plays o'er the fields, and show'rs with sudden hand
Exuberant spring."

Ellen.

Is not *iron* the cause of the gay colours in various flowers?

Mr. L——.

Yes: a chemical analysis discovers the same constituent principles in all, that is to

say, calcareous earth, oil, water, and air, with a portion of iron, to which they owe their beautiful colours. Yet, although composed of similar materials, their juices, to the eye and to the taste, appear as different as their forms. The milk of the poppy, the acid of the sorrel, the sap of the sycamore and maple, and the resin of the tribe of pines, bear no resemblance to each other. Various are the articles of use and pleasure, which man receives from the vegetable world; yet, how many of their qualities remain undiscovered!

Lucy.

Then botany is useful as well as agreeable.

Mr. L——.

The study of botany is not only an elegant amusement, and leads to a display of the beautiful order and variety established by nature, but from the different and important uses of plants in food, raiment, medicine, and many arts, it is of real and essential service to mankind.

The range of botany is wide and exten-

sive, from the small moss and the fungi, which are intersected with the common grass, to the towering pine and the majestic oak. The various kinds of grass which cover the earth ; the flowers of all hues and forms, which exhale the most fragrant odours ; beautiful shrubs and stately trees, are all subjects of the dominion of Flora.

Ellen.

Papa, one of the flowers of the orchis tribe is like a *bee*, and another like a *butterfly*.

Mr. L——.

And a third, still more uncommon, is like a *spider !*

Ellen.

I never heard of that. Do tell me where I may find one ?

Mr. L——.

Not in this island, my love ; the *cypripedium* of South America, in its nectary resembles the body, and in its petals the legs of a large spider ; this singular and ambiguous appearance deters the humming-bird from extracting honey from its flowers.

Caroline.

Plants appear to possess an organical although not a progressive motion, for instance, the *mimosa,* or sensitive plant, is well known to shrink at the touch. In Venus's-fly-trap, or *dionea muscipula,* the leaves are armed with long teeth, like the antenna of insects, and lie spread upon the ground round the stem; they are so irritable, that, when an insect creeps upon them, they fold up and crush or pierce it to death.

Mr. L——.

The *hedysarum girans,* a native of Bengal, has the appearance of voluntary motion. Two small appendages, or leaflets, situated on each side of the foot-stalk, alternately meet and recede during the greatest part of the day. The *helistropium trioccum,* a flower very common in the environs of Montpellier and in Germany, points its blossoms to the sun, and appears eager to draw nourishment from his rays.

Flowers always turn towards the light in order to receive it; under a serene sky

they expand; they are closed during the night, and at morn and eve they seem in aromatic perfume to breathe their hymns of praise. When these flowers are reared in the shade, they are of a pallid hue, and no longer clad in their accustomed colours, rain and storms cause many of them, particularly wood-sorrel, trefoil, mountain-ebony, and the African marigold, to be contracted; and at night they hang down their heads and fold up their leaves, as if yielding to the power of sleep. Some of them, like some animals, sleep during the day and wake during the night.

Margaret.

The night-flowering cerus opens its flowers on the setting of the sun, and closes them on the break of day.

Mr. L——.

The influence of heat in the vernal season, is the same on animals and vegetables; for when the birds begin to warble in the forests, and the finny race to move in the deeps, the plants shoot forth their flowers, and propagate their kind. The wood-ane-

mone begins to blow in Sweden when the swallow arrives; and the marsh-marigold flowers when the cuckoo sings.

Ellen seemed so much interested about the mistletoe just now, that I will mention another kind: the *tillandsia*, a species of the same plant, grows on the tops of trees in America, and has its leaves turned at the base into the shape of a pitcher, with the extremity expanded; in these the rain is collected and preserved, for the thirsty traveller, and for birds and beasts.

Ellen.

Oh, papa! how extremely curious!

Mr. L——.

The wild pine of Campeachy retains the rain-water in its deep and capacious leaves, not less for the refreshment of the tree itself, than for the thirsty native of a burning soil. Thus we see that the different vegetable productions are no less numerous than useful. The purposes to which the trees of Britain are applied are well known, from the flexible willow, which forms your work-basket, to the hardy oak, which com-

prises the most substantial parts of a ship of war. Each possesses different qualities, according to different purposes. The meanest, and, in appearance, the most unpleasing, have their use; even the thistle is not only the food of some animals, but is serviceable in making glass. The iron-wood, solid as marble, furnishes the Otaheitan with his long spear and massy club. The cocoa of the East and West Indies answers many of the most useful purposes of life, to the natives of a warm climate. Its bark is manufactured into cordage and clothing, and its shell into useful vessels; its kernel affords a nourishing and pleasant food, and its milk a cooling beverage; its leaves are used for covering houses, and are worked into baskets; and its boughs are of service to make props and rafters. You may behold the wonderful prodigality of nature even in the common little daisy, which consists of more than two hundred flowers, each as perfectly formed as a rose or a tulip. The different sorts of grass, a term which commonly conveys only one notion

to the vulgar mind and one object to the undiscerning eye, consists of five hundred distinct species, each formed with infinite beauty and variety. I doubt not but you have distinguished the elegant *briza-media*, or middle quiver-grass, so common in fields, and so remarkable for its delicate hair-like stem, trembling at every breeze; and the soft feather-grass too, in its waving plumes resembling the long feathers of a bird of paradise.

Margaret.

Oh yes, dear papa! and the sweet scented vernal grass, which gives its fragrance to the new-mown hay.

Mr. L——.

The lover of botany should not rest satisfied with reading books on the subject, or looking at engravings of plants, even under the superintendence of a kind sister, but enjoy this pleasing and innocent amusement in long rambles; it will make every walk and ride peculiarly interesting, in the most delightful season of the year. Whether you explore the low meadows, or

climb the lofty mountains; whether you penetrate into the shady groves, or traverse the wild and open heaths, you will find numerous subjects for your researches, adapted to the various nature of the soils; and while you pursue your favourite science, my dear girls, you will contribute to your stock of health and spirits, and confirm your love of rural scenes and occupations. During this long digression, have you forgotten the hermitage?

Ellen.

Oh no, I assure you, papa. We all mean to rise *two* hours earlier to-morrow morning, and indeed every day till it is finished, that we may not lose time from our botanical rambles and other studies.

"Let us go into the wood," continued she; and crossing the Chinese bridge, they arrived at Margaret's favourite spot; where, after a long discussion, the point was happily settled, and our young architects commenced their work on the following day.

Notwithstanding the grotto engaged much of their time, our sisters did not forget that the twenty-third class had not been illustrated.

"The disposition of the flowers is the circumstance upon which the twenty-third class, Polygamia, depends," said Caroline to Lucy and Ellen, as they were rambling towards their new retreat. "Its chief characteristic is, that both complete flowers, and one or both sorts of incomplete ones, are either produced on the same plant, or on different individuals of the same species. The first order contains those flowers furnished with all the parts of fructification, as well as those that have only stamens, or only pointals, on the same individual. The different orachs are included in it, also the cross-worts, soft and hard grass, and pellitory of the wall, in which last the incomplete flowers are furnished with pointals, but are deficient in stamens; they are placed between those that are perfect, within the same fence, which is flat, and consists of six leaves; the calyx of both kinds is

four-cleft; they have no corolla, one pointal, and one seed.

'Capricious in attire,
Now green, now tawny, and ere autumn yet
Have changed the woods, in scarlet honours bright,'

appears the sycamore, which, together with the ash and maple, form the chieftains of their clan.

"We are at length arrived at the last class, Cryptogamia, which, as I have already told you, includes those vegetables of the lowest kind, whose flowers are inconspicuous, and have hitherto escaped the researches of the most acute observers. Such are ferns, mosses, sea-weeds, lichens, and mushrooms.

Ellen.

Oh, sister, I had forgotten that sea-weeds were ranked amongst plants. I wish papa would make an excursion to the seaside, that we might search for them on the shore, and examine them.

Caroline.

They are comprised in the three following genera—Laver, Oar-weed, and River-

weed. The substance of the first of these plants is membranaceous, and the parts of the fructification are enclosed in a greenish membrane, rather transparent, and like a bladder. The oar-weed is leathery, and has two kinds of bladders, one of which is smooth and hollow, and interwoven with hairs, and is thought to be the barren flowers; the others, considered as the fertile flowers, are filled with a kind of jelly, which contains small grains, in each of which is one seed. The river-weeds are composed of unequal tubercles, growing on long hair-like stems. Papa has talked of taking us to Brighton the latter end of this summer, but in the mean time you may find dried specimens of each in his cabinet.

The sea-weeds and liver-worts are included in the third order of this extensive class; the parts of their fructification are too little known to supply a regular account of them, for they scarcely admit of a distinction of root, leaf, or stem; much less

can we imagine in what manner the fructification is formed: there are small substances visible in the liver-worts, which are supposed to be their different kinds of flowers, distinct from each other; the fruit and flowers in the sea-weeds are supposed to consist of little bladders, some of which are hollow, and contain hairs within them; others are filled with a kind of jelly. Many of these are of great consequence in the economy of nature, and afford the first foundation for vegetation. Some of them fix upon the barest rocks, and are nourished by what slender supply the air and rain afford them. When these die, they are converted into a very fine earth, which nourishes other species; these, in their turn, are changed into food for mosses; they likewise decay, and in due time a soil is formed from the whole, capable of maintaining trees, plants, and shrubs. This process of nature is sufficiently apparent upon the smooth and barren rocks, upon the seashore.

Lucy.

You mentioned mushrooms, which we well know at first sight from their singular appearance, being without leaves, branches, flowers, or any thing like other vegetables.

Caroline.

The mushroom, or fungi, a very extensive genus, grows horizontally, and is furnished with gills on the under surface; the species we sometimes eat at table is valued for its high flavour, and has a convex scaly white head, which is supported on a stalk or pillar, and the gills are red.

Ellen.

We have often found it in the park and wood, as well as a great variety of the tribe of agarics. Spunk has pores instead of gills on the under surface. The morell is smooth underneath, and has a kind of network on the upper part. That which we eat has a naked wrinkled pillar, and a hat that is egg-shaped, and full of little cells. Puff-ball is a roundish-formed fungus, filled

with a mealy powder, that I fancy to be the seeds. The truffle used for food has no root, but grows just under the surface of the ground; it is round and solid; the outside is rough.

Caroline.

Well, my little mushroom girl, you seem quite skilled in this extensive genus. Can you tell me how the last-mentioned subterraneous delicacy is procured?

Ellen.

I have learned it all from *good* Mrs. Wakefield. The method of finding the truffle is by dogs, which are taught to hunt for it by scent; as soon as they perceive it, they begin to bark and scratch up the ground, by which their masters know that the treasure they are seeking for is at hand.

Now will you describe some other plant? I like this class very much.

Caroline.

The blossoms, or rather the parts of fructification, in ferns, are sometimes produced in spikes, though they are more ge-

nerally found upon the backs of the leaves, and when magnified, appear to consist of a scale proceeding from the leaf, with an opening upon one side; some little globules lie concealed beneath this scale, supported on foot-stalks, and surrounded by an elastic ring; when the seed is quite ripe, these balls burst, and there issues a fine powder from them, which is supposed to be the seeds. Maidenhair spleenwort is a pretty and elegant fern, not unworthy of a place on shady rock-work, and about grottoes or fountains; its leaves are doubly compound, the little leaves alternate; the wings are shaped like a wedge, divided into lobes, and grow upon foot-stalks. Pepper-grass, the rarest of our indigenous glants, horse-tail, adderstongue, and moon-wort, belong to the tribe of ferns. Osmund-royal is found in watery meadows; its leaves are doubly winged, terminating in clusters of fructification. The rough naked stem of the shave-grass is used by cabinet makers and turners, to give their work a polish.

Rusty-back has the whole under surface of its leaves covered with the fructification. In the polypody, each blossom is a distinct round dot, placed on the under surface of the leaves. Spleenwort produces its fructification in straight lines. Harts' tongue has simple entire leaves, resembling the form of a tongue, with hairy stalks, and the fructification in double lines between the veins; it is found growing on old walls and moist shady rocks. Moon-wort has globular capsules disposed in a bunch: the seeds are very small and numerous. The common sort grows on hilly pastures; it has a solitary naked stem, and one winged leaf.

Lucy.

I shall be delighted to procure each of these. I have heard papa say, that the rein-deer of the Laplander, so necessary to his support and existence, could not live throughout the dreary season of winter, were it not for the almost only vegetable to be found on the bleak mountains of Lap-

land, the *lichen rangiferinus*, which he digs from beneath the snow. Now will you be so good as to give me some account of the lichens, or liver-worts?

Caroline.

The liver-worts spread themselves like meal, crust, leaf, or thread, over the ground, plants, rocks, or shrubs; and being so numerous, they are subdivided, according to the different circumstances of their growth, as well as the form of their receptacle: this genus has a flat, roundish, shining receptacle, very gummy, and the leaves are covered with meal or dust. The first section is tubercled; they adhere to the bark of trees, in the form of a crust, studded with convex receptacles, or tubercles, which are sometimes fancied to resemble the lines in maps. The second is the saucer-like, because the crust is sprinkled with little hollow receptacles, something like saucers.

Lucy.

Really this is a most delightful class. What does the next section contain?

Caroline.

Thirdly, the tiled, composed of many small leaves growing in a circle, the smallest in the middle, and those which are largest on the outside. Fourthly, the leafy is distinguished by leaves that are distinct from the substance upon which they grow, and are jagged or torn in various directions; the saucers or shields are large, and often grow on foot-stalks, either between the veins, or upon the edges of the leaves. There is one species that is rather upright and leafy; it is white and downy underneath, and branched like the horns of a stag; it has an extraordinary capacity for imbibing and retaining odours, and on that account, is useful to the perfumers as the basis of their scented powders. Fifthly, leather-like; the leaves of this division resemble leather in substance; the shields, which are large, are mostly found upon the edges of the leaves. Sixthly, sooty: appearing black, as if burnt, and adhering only in one point to the substance upon

which they grow. Seventhly, cup-bearing: consisting at first of a granulous crust, which afterwards unfolds into small leaves; from these arises a stem, supporting the receptacles, which are formed like a glass or cup; upon the edges of these cups are often seen little brown or scarlet tubercles. Eighthly, shrubby; branching out like little shrubs or coral. The celebrated moss you mentioned, Lucy, belongs to this division; it is perforated, much branched, the smaller branches nodding. Ninthly, threadlike: the branches shooting out like so many threads, mostly from the branches of trees, which gives this kind the name of tree-moss.

Lucy.

It will be extremely amusing to search for specimens of each of these.—Margaret is coming towards us; she holds in her hand a little basket of moss, for the grotto, I suppose—now, as *moss* belongs to Cryptogamia, will you describe its fructification to us?

Margaret.

We will apply to Caroline presently.—The grotto is just finished, so I have collected all the different sorts that I could find; for papa has been telling me, that mosses, although apparently insignificant, are not useless; they protect the roots of tender plants equally from the extremes of cold and heat; and many kinds of them, by flourishing in the shallow parts of pools and marshes, convert, in a long course of time, that part which before was only water and bog, into fruitful land and useful pastures.

Caroline.

Do you remember an interesting anecdote, that we read a few weeks since, in the life of the enterprising and unfortunate traveller, Mungo Park? During the time that he was in the interior of Africa, in the midst of a vast wilderness, in the depth of a rainy season—naked and alone; surrounded by savage animals, and men still more savage; five hundred miles from the near-

est European settlement—a stranger in a strange land. Overcome with melancholy reflections, his spirits failed him, and he considered that he had no alternative but to lie down and perish. At this moment the extraordinary beauty of a small piece of moss in fructification, irresistibly caught his eye. The whole plant was not larger than the top of one of his fingers: yet he could not contemplate the conformation of its roots, leaves, and capsula, without admiration. He considered that that Being, who planted, watered, and brought to perfection, in that obscure part of the world, a thing which appears of so small importance, could not look with unconcern upon his situation and sufferings. This little anecdote shews from what trifling circumstances the mind will sometimes derive consolation—for reflections like these would not allow him to despair; he started up, and disregarding both hunger and fatigue, travelled forwards, assured that relief was at hand.

Margaret.

Ah, this is a striking instance of what you once said to me—the works of nature must raise the contemplative mind to nature's God.

Lucy.

It is a very interesting anecdote.—Papa will soon overtake us—let us wait for him.

Mr. L——.

Well, my young friends, I imagine by your prettily arranged basket of moss, that you are at length arrived at the last class, Cryptogamia?

Ellen.

Yes, indeed, papa, we are; but we shall not cease to collect stores for our *hortus-siccus*, nor to copy the flowers we select. We intend commencing again, that we may be quite perfect.

Mr. L——.

I am glad to hear it, my love. Among vegetable productions, we cannot fail to notice the tribe of *mosses*, of such variety

in their forms, that they scarcely yield to any species of plants in number; and although extremely minute, are of such an admirable structure, that they excel the stately palms of India, or the sturdy oaks of England. These mosses are dried up in summer, but in winter they revive and wear a peculiar verdure; and as the season advances, they protect the roots of plants from cold—from the chilling blasts of spring, and the scorching heat of the summer sun.

Here is the long trailing feather-moss, with its leaves spreading every way. The common hair-moss also, which is indeed the most magnificent of all its family; the stamens and pointals grow upon distinct plants; the fertile flower is in the form of a little rose or star, surrounded with whitish-edged leaves; the solitary capsule, crowned with a conical lid, sits upon a small eminence, which supplies the place of a receptacle, under the protection of a woolly veil.

Caroline.

The fern-feather-moss is very small, but extremely elegant. I suppose you found it in some shady lane, or upon the banks of a brook. The stems rise from the end; the wings are simple, though winged; the tips are crested with a lid of a lively red, and the mouth edged with a fringe of the same colour.

Mr. L——.

Here is the waved thread-moss, known by its stems branching every way in a very graceful manner: it is rarely found in fructification.

Lucy.

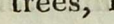
Will you tell me what that moss is called which we so often see growing upon thatched cottages?

Caroline.

The thread-moss; it is a great preservative to thatch; it has perpendicular lips and reflected leaves, which terminate in hoary hairs: happy is it for the poor cottager, when this moss begins to vegetate upon the

roof of his humble dwelling, for it forms a defence against the injuries of the weather, and having covered the thatch, will last for many years.

The beautiful hue of the silvery thread-moss at once points it out, and renders it impossible to be mistaken. The broom-fork-moss, with its little curved capsules, is known by its stems being covered with a brown silky down. Here is also a specimen of great-water-moss; it is found upon rocks and roots of trees, in brooks and rivulets. The Scandinavians line the inside of their chimnies with this moss, to defend them against the fire, for, contrary to the nature of all the rest of its species, this is hardly capable of burning.



"We have now heard a description of all the specimens you have collected, my love," said Mr. L——, smiling fondly upon his Margaret. "Will you conduct us

to the grotto? I have not seen it since it has been finished."

Our happy group, animated with the genial glow of affection one for the other, continued their walk down the sequestered winding path, attended by their father, who with heartfelt pleasure listened to his children.

At length, after passing through the shrubbery, which consisted of a beautiful variety of evergreens, flowering shrubs, and elms, whose stems were covered with a mantle of venerable ivy, they opened the little green gate, and following a serpentine walk, under a sable canopy of spreading yews, winding to an elegant vista, bordered on either side with laurels, syringas, lilacs, and roses, overhung with the golden clusters of the laburnum, interspersed with branching oaks, stately sycamores, and beeches, entwined with wreaths of the flaunting woodbine, and arrived at the temple; a flight of steps, covered with turf, led to it; the pillars were elegantly orna-

mented with shells and moss; festoons of roses and sweet flowers were hung by the amiable Caroline; Lucy's and Ellen's active fingers had assisted in lining it with artificial coral, shells, stones, sea-weeds, spars, and moss. A little Gothic arched window, with the inscription, "L'AMITIE," nicely painted in large letters upon the glass, attracted the attention of the tender parent.

"This grotto, papa," said his eldest girl, throwing her arm around his neck, "is to be dedicated to *Affection* and *Friendship*."

"Our botanical pursuits seem to have rendered us doubly dear to each other. By having had the same end in view, we have been taught to love each other more, and to value still more highly the blessing we enjoy in having *such* a father to direct us in every thing that is good!"

"And," said Margaret, joining in the embrace, "it shall be dedicated to our Caroline, in commemoration of Caroline's

goodness, and in commemoration of the happiness we enjoy in possessing *such* a sister."

FINIS.

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