

445. Specific names are generally *adjectives*; generic names are *nouns*. The specific name sometimes indicates the number of leaves, as *ORCHIS bifolia*, (*bifolia*, signifies two leaves,) or the colour of the corolla; as *VIOLA tri-color*, (three coloured Violet,) or the form of the root; as *SOLANUM tuberosum*; (potato with a tuberous root.) Specific names are also derived from the names of persons; thus a species of the genus *Bidens* is named *Beckii*, in honour of Dr. Beck, a botanist of the state of New York.

The name *RENSELÆRIA* has lately been given to a newly discovered genus; this is called after Mr. Van Rensselæer a distinguished patron of American science.

Natural Method.

446. The natural method consists in bringing together such plants as seem by nature to constitute one family, resembling each other in general appearances and medicinal qualities; as lilies, herbs, trees, mosses, and ferns. Some of these natural families show a similarity in form and quality, and are evidently distinct from all others. If the whole vegetable kingdom could thus be distributed into natural tribes, we should need no other system than that of nature. But as we proceed on this plan we soon find difficulties; for, after selecting a few families which nature seems to have formed with striking marks of resemblance, we find others, less distinctly marked, and we at length see a vast number of plants which cannot be referred to any natural families.

447. It is by their natural characters, that persons who have never heard of such a science as *zoology*, or the classification of animals, are enabled to distinguish ferocious beasts from domestic and gentle animals; they see a sheep or a cow without any terror, although that individual one they may never have seen before; for nature teaches them to consider, that, as resembling other sheep and cows, which they know to be inoffensive.

448. This natural character teaches savages to distinguish among the many plants of the forest, those which may administer to their wants, and those which would be injurious.

445. What is said of specific names?

446. Give some account of what is called in Botany the Natural Method.

447. How do persons ignorant of the science which classes animals distinguish ferocious beasts from domestic animals?

448. Of what use is the natural character of plants to Savages?

459. Even the lower grade of animals have this faculty of selecting by natural characters, nutritious substances, and avoiding noxious ones; thus we see the apparently unconscious brutes luxuriating in the rich pastures prepared for them by a benevolent Creator, cautiously passing by the poisonous weed, directed by the curious instinct given them by 'his same A' mighty Benefactor.

CHAPTER XVIII.

Natural Families

450. A *natural family* is composed of several genera of plants which have some common marks of resemblance, and its name is usually founded upon this general character; as *Labiata* and *Cruciform*, which are derived from the form of the corollas; *Umbellate* and *Corymbiferous*, from the inflorescence; *Leguminous*, from the nature of the fruit.

451. Natural families resemble artificial orders in being composed of genera, but the principles on which the genera are brought together, differ widely in the two cases.

452. In many natural families, the classification is such as persons who have never studied botany, might make; thus, dill, fennel, caraway, &c., belong to the *umbellate* family, on account of the form in which the little stalks, bearing the flower, and afterwards the seed, branch out from one common centre, like the sticks of an umbrella; this general resemblance is observed by all, and it seems very natural to class such plants together.

453. But in the artificial orders, genera which may be very unlike in other respects, are brought together from the single circumstance of their having the same number of stamens and pistils. Thus, in the first order of the 8th class, we have the Tulip and the Burlish, the Lily of the valley and the Sweet-flag. In the second order of the 5th class, we have the Beet and the Elm. You will at once perceive the want of resem-

449. Are animals capable of distinguishing plants by their natural characters?

450. What composes a natural family of Plants, and on what is its name often founded?

451. How do families resemble artificial orders?

452. Could a person ignorant of botany form a classification of plants into natural families?

453. How are genera brought together in the artificial orders?

balance in the general appearance of these plants, and that an arrangement, which thus brings them together, is properly called an *artificial* method.

454. Many families of plants possess a marked resemblance in form and qualities, and appear evidently as distinct tribes. If the whole of the vegetable kingdom could thus be distributed into natural classes, the study of botany would be much simplified; but it has already been remarked, that there are many plants which cannot be thus arranged, and no principle has yet been discovered for systematic arrangement, which bears any comparison to the Artificial System.

455. Here plants are conveniently arranged, like words in a dictionary, and thus easily found out and referred to their natural classes: no other system exists which can with certainty direct us to these classes.

In commencing our remarks upon some of the natural families, we will first consider the

LILIACEOUS FLOWERS.

456. These flowers consist of six petals, spreading gradually from the base, and exhibiting a kind of bell-form appearance but differing from the bell-form flowers in being polypetalous.

457. The number of stamens in the Liliaceous plants is generally six, sometimes but three; they are usually alternate with the petals.

458. The germ of the Liliaceous plants is always of a triangular form, and contains three cells; the roots are mostly bulbous.

459. The Lily has a scaly bulb, the Onion a tunicated or coated bulb, the Tulip has a bulb which seems almost solid and tuberous.

460. The calyx is mostly wanting in Liliaceous plants, the stems are simple without branches; the leaves entire, and nerved. To this family belong the Tulip, Lily, Crown-imperial, Dog-tooth-violet, &c. Plants of this natural family usually belong to the class Hexandria; the Crocus having three stamens, belongs to the class Triandria.

-
454. Can all plants be easily arranged in distinct tribes?
 455. How are plants arranged in the artificial system?
 456. Describe the corolla of liliaceous flowers.
 457. What is said of the stamens of liliaceous plants?
 458. What is said of the germ?
 459. Of the root or bulb?
 460. Of the calyx, stems, leaves, &c.?

CRUCIFORM FLOWERS.

461. These are such flowers as have a calyx consisting of four leaves, and a corolla composed of four petals; each petal is fastened to the receptacle or bottom of the calyx by a narrow part called the claw. In the centre of the flower is a single pistil long and cylindrical; the stigma is oblong, and divided into two parts, which are reflexed or bent back on each side. Each petal is placed between two leaves of the calyx; this alternate position is always seen in flowers where the number of petals equals the number of leaves of the calyx.

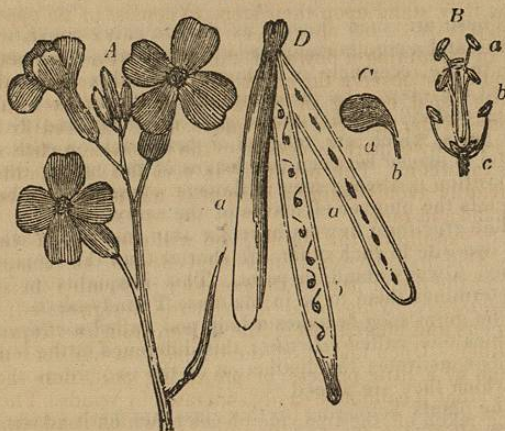
462. The cruciform flowers have six stamens, two of which, standing opposite to each other, are shorter than the remaining four, which always stand in pairs. This inequality in their length determines them to be in the class Tetradynamia.

463. The germ soon becomes a long pod, called a *siliqua*, or a short, thick one, called *silicula*; this difference in the length of the pods constitutes the distinction of the two orders of the class in which they are placed.

464. The plants belonging to this class are herbaceous, the leaves are alternate; the Cabbage, the Mustard, the Radish and Stock-gilly-flower, belong to this family. They are found on a chymical analysis, to contain some sulphur.

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461. What are cruciform flowers?
 462. What is said of their stamens?
 463. What is said of the germ?
 464. What of the leaves, &c.?

Fig. 69.



465. Fig. 69, *A* represents a flower of the cruciform family; *B*, may be seen the stamens arranged in two sets, the four at *a* being longer than the two at *b*; at *c*, are two glands between the short stamens and the germ; at *C*, is a petal, consisting of *a*, the border, and *b*, the claw; at *D*, is the pod or silicle; *a*, represents the valves, *b*, the seeds, as alternately attached to the edges of the partition or dissepiment which divides this kind of pericarp into two cells.

PAPILIONACEOUS FLOWERS.

466. These are so called from a Latin word *papilio*, a butterfly, on account of the supposed resemblance between them and that insect; they are generally flowers with brilliant colouring, and of a showy appearance. The sweet-pea may be given as an example; this unites to delicacy of colour and beauty of form, a highly fragrant perfume.

467. The flowers belonging to this natural family are so peculiar in appearance as to make them easily recognized. The Rose, the Pink, and the Bell-flower, are regular in their form, that is, there is a symmetry and equality in their parts. Irre-

465. What does Fig. 69 represent?
 466. Describe the papilionaceous flowers
 467. Are these flowers regular?

gular corollas are various in their forms; the papilionaceous seem, as they stand upon their stem, to consist of an upper and under part.

468. In examining a flower of this kind, a Pea, for example you should first observe the calyx, this is monosepalous, that is, one entire sepal, ending in five distinct leafy points; the two upper ones wider than the three under ones. The calyx bends towards the lower part, as does also the peduncle, or little stalk which supports it. The peduncle is very flexible; so that the flower readily avoids facing a current of air, and turns its back to the wind and rain.

469. In examining the corolla, you will see that it is *polyptalous*. The first piece is a large petal covering the others, and occupying the under part of the corolla; it is called the *standard* or *banner*. This petal is evidently designed, to protect the stamens and other parts of the flower, from the injuries of the weather. Upon taking off the banner you will find that it is inserted by a little process, or projecting part, into the side pieces, so that it cannot be easily separated by winds. The banner being taken off, the two side pieces to which it adhered are exposed to view; these are called the *wings*; they are strongly inserted into the remaining part of the corolla, and their use appears to be, that of protecting the sides of the flower. Upon taking off the wings, you will discover the last piece of the corolla, called, on account of its form, the *keel*, or *boat*. This covers and protects the stamens and pistils.

470. Upon drawing the keel downwards, you will find ten stamens; they are joined together by the sides of their filaments, appearing like a cylinder surrounding the pistil.

471. One of these stamens, however, does not adhere to the rest; but as the flower fades and the fruit increases, it separates and leaves an opening at the upper side, through which the germ can extend itself by gradually opening the cylinder. In the early stage of the flower, this stamen will seem not to be separated; but by carefully moving it with a pin or needle, its filament will be found unconnected with the other nine.

472. Most of the papilionaceous plants belong to the class Diadelphia, order Decandria. But if the flower, although papilionaceous, should have ten stamens all in one set, it is then placed in the class Decandria. According to this arrangement, a very striking natural family of plants is widely separated.

468. What are the appearances presented by a pea flower?
 469. What may be seen by examining the corolla of a pea?
 470. How many stamens does this flower contain?
 471. Do they all adhere together?
 472. To what class do most of the papilionaceous flowers belong?

rated, a part being taken from the 16th class and carried to the 10th.

473. The germ of the papilionaceous plant extends itself into that kind of pod called a *legume*. The term Leguminous, which is taken from the fruit, as Papilionaceous is from the flower, is applied to the family of plants we are considering.

474. In this family we find the fine table vegetables, Beans and Peas, the useful medicinal plant, Liquorice, the fine colouring Indigo, the fragrant Clover, so grateful as food to many of the domestic animals; the splendid Locust tree, the elegant Lu pine, and the delicate and odoriferous Sweet-pea.

CHAPTER XIX.

Natural Families.—Labiatae Plants.

475. The flowers belonging to the *labiate* family are monopetalous, consisting of one piece, and are irregular in their outline and appearance.

476. The term Labiate, derived from a Latin word *labia*, lips, has been given, on account of the flower appearing to be divided at the top into two parts, resembling the lips of a horse or other animal. See Fig. 47.

477. This natural family is sub-divided into *ringent* and *gaping*, where the entrance into the corolla is open, and *personate* or *masked*, where the corolla is closed by a prominent throat or palate.

478. The labiate flowers have mostly four stamens of unequal length, standing in pairs, beneath an arch in the upper lip of the corolla. On account of this circumstance, they are ranked in the class Didynamia. A few of the Labiate plants have but two stamens, and on that account, are placed in the class Diandria, as the sage and mountain-mint. Here again the artificial system separates a tribe, which nature has made strikingly similar. If you examine a flower of this family, the Balm or Catmint, you will notice the arched upper lip of the petal covering the stamens, and that the lower lip hangs down so that you can see

473. What does the germ of the papilionaceous plants become?

474. What are some of the plants found in this family?

475. What is said of the flowers belonging to the labiate family?

476. Why are they called labiate?

477. How is this family sub-divided?

478. What is said of the stamens of labiate flowers, and to what class do these flowers belong?

the inside of the corolla. If you pull out the corolla you will take the stamens along with it, the filaments being attached to it, as they usually are to monopetalous corollas. The corolla has a small aperture at the base, through which the pistil grows from the receptacle.

479. You have already been informed that the Labiate flowers belong chiefly to the class Didynamia. The ringent division of plants belongs to the order Gymnospermia, having four seeds, lying naked in the calyx. The personate division belongs to the order Angiospermia, having the seeds inclosed in a capsule until they are ripe, when the capsule opens spontaneously and disperses them.

480. The ringent flowers generally grow in whorls or circles, and at the upper part of an angular stem, the leaves standing opposite. These plants are never poisonous. Among them we find many aromatic plants, the Peppermint, Lavender, Savory, Majorum, Thyme, &c.; also many herbs which are useful in sickness, as Pennyroyal, Catmint, Horshound, &c.

481. The personate division affords some very splendid flowers, as the beautiful Gerardia, or American Foxglove, and the magnificent Bignonia, (Trumpet flower.) The plants of this order seem to be somewhat allied to those of the class Pentandria, in many of these, as in the Snapdragon, (Antirrhinum,) the Pentstemon, &c., there exists the rudiments of a fifth stamen, in accordance with the five divisions of the calyx and corolla. Some plants of this division of the Labiate family are poisonous, as the Foxglove and the Snapdragon.

UMBELLATE PLANTS.

482. The plants of this natural family are found in the artificial class Pentandria; they derive their name from the Latin word *umbella*, an umbrella, on account of the manner in which the peduncles of the flower stalks spread out from the main stem. See Fig. 56, b.

483. The umbellate plants are mostly herbaceous, those which grow on dry ground are aromatic, as Dill, Fennel, and Caraway: those which grow in wet places, or the aquatic species, are among the most deadly poisons, as Water-Hemlock, &c. Plants of this family are not in general so beautiful to the

479. What are the orders in this class?

480. What is said of the ringent flowers?

481. What is said of the personate division?

482. In which class are the umbellate flowers found and from whence then do they take their name?

483. Describe these plants.

sight, nor so interesting as many others. The corolla is superior, or over the germ, consisting of six petals, usually with a stamen standing between each petal. From the centre of the flower arise two styles, which often remain permanent upon the fruit.

484. The general figure of the fruit is oblong or oval; it separates perpendicularly into two seeds, as may be seen in the Fennel or Dill. The figure, margin, and angles of the seeds are considered as affording proper characters of the genera; as in the Parsnip they are flat, in the Carrot bristly, in the Hemlock marked with ridges. Among the plants of this family which are used as articles of food, are the Carrot, Parsnip, Celery, and Parsley; the aromatics are Dill, Fennel, Sweet Cicely, Caraway, and Coriander; and among the poisonous plants, are the Conium, (Poison Hemlock,) Water-Parsnip, and the Cicuta, (Water-Hemlock.)

COMPOUND FLOWERS.

485. The flowers of this family begin to blossom in the latter part of summer, and are found almost bordering upon the verge of winter. The Dandelion is among the earliest flowers of spring, and one of the latest of autumn. The Daisy, in its native country, is found in almost every spot which exhibits any marks of fertility; but with us is nowhere found except in gardens.

486. The Dandelion is not a single flower like a violet or rose, but a crowded cluster of little flowers. The Sunflower is so large and conspicuous, as doubtless to have frequently attracted your notice. If you examine one carefully, you will find it to be composed of more than a hundred florets or little flowers, each as perfect in its kind as a lily, having its corolla, stamens, pistils, and seed.

487. We distinguish the Sunflower into two parts—the *disk*, which is the middle of the flower, and supposed to have a resemblance to the middle or body of the sun; the *ray* is the border of the flower, it contains those florets which spread out from the disk as rays of light diverge from the sun. The florets in this, as in other compound flowers, do not all begin to expand at the same time, they usually begin at the disk, and proceed inwards towards the centre.

484. What is observed of the fruit of the umbellate plants?

485. What is said of the blossoming of compound flowers?

486. How do the dandelion and sunflower differ from the violet and rose?

487. Into what two parts would you distinguish the sunflower?

488. If you examine with a microscope one of the florets of the disk, you will perceive it to be tubular, containing one pistil, surrounded by five stamens, the styles of which are separate, but the five anthers grow together, forming a tube around the pistil. It is this union of anthers which gives to compound flowers a place in the class Syngenesia, which name signifies anthers growing together.

489. The florets of the ray are called *neutral*, having neither stamens nor pistils; the circumstances of its having neutral florets in the ray, places the Sunflower in the order *Frustranea* of the 17th class.

490. Although the term *compound* is applied to the flowers of the class Syngenesia, the real circumstance on which the class is founded is not the compound character of the flower, but the union of anthers.

491. A Clover blossom, in one sense, may be said to be compound, as it is a collection of many little flowers compounded or united into one; but each little floret of the clover has its own calyx; there is no general calyx inclosing the whole, as in most of the Syngenesious plants, but the florets are arranged in such a manner as to form a head; the anthers are separate, the filaments are connected at their sides, and this latter circumstance, together with the papilionaceous form of the corolla, places the clover in the class Diadelphia.

492. Most of the Syngenesious flowers are composed of two sorts of florets; they are either *tubular*, or *strap* shaped, (*ligulate*), appearing flat like a strap, both kinds are toothed at the edge; the ligulate are sometimes called Semiflorets, or half flowers.

488. What is the appearance of the florets of the disk when examined by a microscope?

489. Why are florets of the ray called neutral?

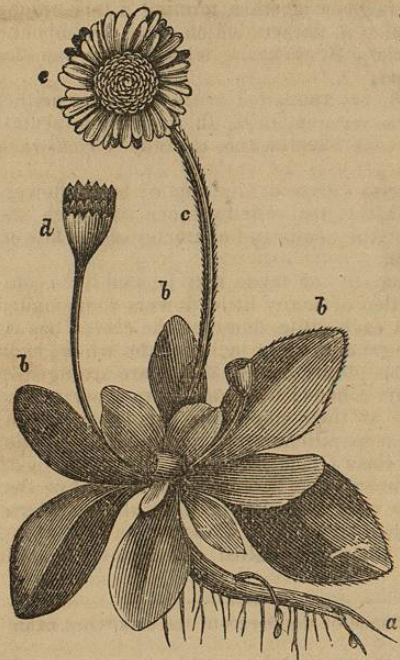
490. Is the class Syngenesia founded on the compound character of flowers?

491. Why does not the clover belong to this class?

492. What two sorts of florets are generally found in Syngenesious plants?

Analysis of the Daisy.

Fig. 70



495. 3. The *Stem, c*, is called a *scape*, because it springs directly from the root, and bears no leaves.

496. 4. The *Calix, d*, is said to be *hemispherical*, or a half sphere; it is *common*, that is inclosing many florets; the leaflets of the calyx, sometimes called scales, are *equal*, or of the same size.

497. 5. The *Corolla, e*, is *compound*, having many florets on one receptacle, *radiate*, having rays; the florets of the disk

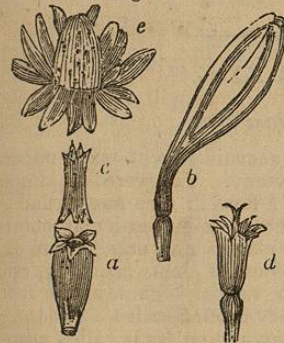
493. What kind of root has the daisy?
 494. Describe its leaves.
 495. What kind of stem has the daisy?
 496. Describe its calyx.
 497. Describe the corolla.

We have, at Fig. 70, a representation of the Mountain Daisy, we will now consider the appearance of its different parts.

493. 1. The *Root, a*; you will observe this answers to the description of *fibrous*, as small thread-like parts issue from the main root, or *radix*.

494. 2. The *Leaves, b*; these, you observe, spring from the root, and are hence called *radical*; being undivided, they are called *simple*. In form they are somewhat *oval*, with the narrow end towards the stem; this form is called *obovate*. The leaves are said to be *crenate*, on account of their scolloped margins.

are *tubular* (Fig. 71, *a*); they have both stamens and pistils; they are funnel-shaped, and five toothed; the florets of the ray Fig. 71, *b*, are flat, and have pistils without stamens.



498. 6. The *Stamens, c*, are *five*, united by their anthers, forming a tube.

499. 7. The *pistil*, in the disk florets, through the tube formed by the anthers, *d*; the stigma is parted into two divisions which are *reflexed* (bent back); the pistil in the ray through the tube of the floret.

500. 8. The Daisy has no *pericarp*, or seed vessel, the seeds grow upon the receptacle, *e*, they are single and shaped somewhat like an egg; they are also naked, that is, destitute of the downy plume called *egret*, which is seen upon the dandelion, and many other of the syngenesious plants.

501. 9. The *receptacle* is *conical*, or in shape resembles a sugar-loaf. It is dotted with little holes: these are the places in which the seeds were fixed. The appearance of the receptacle, whether naked or chaffy, is very important to be observed in the syngenesious plants; it sometimes constitutes a distinction between genera.

502. The botanical name of the daisy is *BELLIS perennis*. It belongs to class 17th, Syngenesia, because the anthers are united; order 2d, Superflua, because the pistils in the ray are superfluous, or have no stamens. The generic name *Bellis*, is perhaps from the Latin word *bellus*, handsome; the specific name, *perennis*, signifies that it is a perennial plant, or one whose roots live several years.

503. The common name, *daisy*, is derived from a property which many of the syngenesious plants possess, of folding up their petals at the setting of the sun, and expanding them with its rising. The poet Chaucer, who lived in the fourteenth century, is said to have first noticed this circumstance, and to have

498. Describe its stamens.
 499. How is the pistil situated?
 500. Where do the seeds grow?
 501. Describe the receptacle of the daisy.
 502. What is the botanical name and classification of the daisy?
 503. Why was this flower called daisy?

called the flower Day's-eye. The French name for the daisy is *la belle Marguerite*.

CHAPTER XX.

Class 1st—Class 2nd.

504. You have now been made acquainted with many important principles in the science of Botany. You were first taught the names of the different parts of a flower; then how to find to what class, order, genera, and species, some particular plants belonged; and after that, all the classes and orders were explained. We then took up the subject of plants generally, and considered them as respects their various organs, as the root, stem, leaf, &c.; this part of the study is often called *elementary Botany*, while the study of classes and orders is called *systematic Botany*.

505. The different families of plants, as they seem distinguished by nature, were next considered. It is to be hoped that you now understand clearly the difference between *natural families*, and *artificial classes*; viz. that the former, such as the families of lilies, roses, &c. are distinguished by characters which may be noticed by all observers; while the latter are founded upon circumstances which botanists have agreed to found their classifications upon.

506. In pursuing the study of Botany, it is necessary that you should have a great deal of practice, in the systematic part; that is, that you should analyze many plants, and be careful to collect and examine flowers. We shall now consider some of the classes and orders in a more particular manner, and give examples of plants which belong to them.

504. What is said of the different principles which you have now been made acquainted with?

505. What do you understand to be the difference between *Natural Families* and *Artificial Classes*?

506. What is said of *practice* in Botany?

CLASS 1.—MONANDRIA.* One stamen.

It contains two orders.

507. The first order of the first class is *Monogynia*, or one pistil. There are few plants in this class; the genus *Hippuris*, or mare's tail, which grows in water and marshes, and is therefore aquatic, belongs here. It is considered a perfect flower, because it has a stamen and pistil, though it has neither calyx nor corolla.

Fig. 72.



508. Look at Fig. 72, and you will see at *a*, that the stem is *erect* and *simple*; the leaves *linear*, *acute*, and growing in *whorls*.

At *b*, is a representation of a flower of this plant as seen through a microscope; the germ is *egg-shaped*; the style is long and *awl-shaped*; the stigma is small and pointed; the anther is large, and connected to the germ by a short filament.

You must study the explanations and look at the figure until you can tell the different parts as represented.

509. Southern countries have some very valuable plants of this class; as the Arrow-root, which, when made into gruel, is nourishing to the sick; persons have sometimes lived for weeks upon this; it has been found very beneficial for feeble children who could not bear milk. This substance looks like starch, and is prepared by wetting it first with a little cold water, and then pouring upon it boiling water in the same manner as for making starch.

510. The Ginger is botanically called *Zinziber*, a name

* Here the pupil can consult pages 24 and 25, where he will find that *Monos* is the Greek for *one*, and *andria* for *stamen*; therefore the 1st class is called *Monandria*, because it has one stamen. For an explanation of the names of the orders, he must look to Chap. V. It is recommended to the teacher to examine the pupil closely upon the classes and orders, and especially the derivation of the terms by which they are designated.

507. What is said of the 1st order of the class *Monandria*?

508. What does Fig. 72 represent?

509. What is said of the Arrow-root?

510. What is said of Ginger?

which is said to be of Indian origin, the plant being a native of the West Indies. It is placed in the class and order we are now considering, because it has but one stamen and one pistil. Its flowers are beautiful, and highly odoriferous. It is the root of this plant which affords the ginger powder, so much used in making gingerbread, beer, &c. The roots are first dried, then ground; but impositions are often practised by mixing some less valuable substance with the ground ginger. It is therefore best to buy it in the root. The fresh root of ginger is made into sweetmeats in the West Indies; these are often brought to the United States, and kept by nice housekeepers in order to add a flavour to other preserves.

511. ORDER 2. DIGYNIA; this has one stamen, and two pistils. We here find *Blitum*; it has no corolla. Look at Fig. 72, at *c* you will find a representation of this flower; its calyx is deeply three parted; the germ resembles a berry, and is crowned by the two reflexed styles.

CLASS II. DIANDRIA. *Two stamens.*

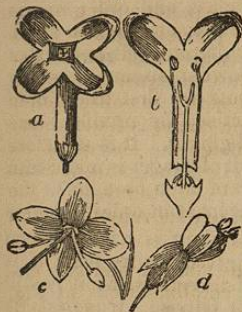
Order Monogynia, one pistil.

512. For an example in this class and order, you have here a representation of the blossom of the Lilac, of which the scientific name is *Syringa*, said to be derived from a Turkish word signifying pipe, the stems of pipes being sometimes made of the roots of the plant.

511. What is the name of the 2d order, and what plant is described under it?

512. What plant is spoken of under the 1st order of the class Diandria?

Fig. 73.



513. Fig. 73, at *a*, shows a flower of the lilac; the corolla is *salver form* having a flat four-parted border, spreading from a tube. You might at first suppose the lilac to consist of four petals; but if you should, in a real flower, attempt to separate them, you would find the whole united, and that it is monopetalous. In flowers of one petal, the stamens are generally fastened to the corolla; where there are several petals, the stamens are usually attached to the receptacle. At *b* the lilac is represented as if cut lengthwise, to show the two stamens stand-

ing opposite to each other, and attached to the corolla.

514. The flowers of the lilac are crowded together in that form of inflorescence which is called a *thyrse*. This flower, although so common, is an exotic. There are two species, which are frequently to be met with in this country; the most common is the *vulgaris*, which has broad heart-shaped leaves; the *persica*, or Persian, has lanceolate leaves. The word *lilac* is derived from the Persian, and signifies a flower. These plants are shrubs, and distinguished by large showy thyrses of fragrant purple or white flowers.

515. The *Veronica*, or Speedwell, is found in America, though there are here but a few species of it, compared to those of Europe. It has a wheel-shaped corolla, deeply four-cleft, with the lower part somewhat smaller than the others, as may be seen at Fig. 73, *c*; the two stamens and the pistil may be seen in the picture. The *beccabunga* is one of the most common American species of this genus; it is found on the borders of brooks and in ditches. The petals are blue, but very soon turn black; yet although this plant does not make a handsome appearance in an herbarium, it is desirable to obtain it, as there are so few specimens of this class and order. One species of this genus, the *alpina*, is common to the Highlands of Scotland; another species is found only upon the Cheviot Hills between England and Scotland. Various species of it abound in Wales and other parts of Great Britain.

516. The *Circaea* is represented at Fig. 73, *d*; the calyx s

513. What does Fig. 73 represent?

514. What farther is said of the lilac?

515. Describe the Veronica.

516. Describe the Circaea.

morosevalous, or has but one leaf, it is divided into two parts which are *reflexed*; the corolla has two petals; the germ is below the calyx. This is a very small perennial plant which grows in shady places; its blossom is white, and remarkable for the symmetry of its parts, having *two* stamens, *two* petals, a calyx with *two* divisions; a capsule with *two* cells, each of which contains *two* seeds. Its common name is Enchanter's night shade; this plant is common about the shores of the Cumberland lakes in England, and the Highland glens of Scotland, as well as in the United States.

517. The *Olca*, or olive, is said to derive its scientific name from a Latin word signifying oil. This plant is an evergreen tree which grows to the height of twenty or thirty feet; it is common on the rocks of Palestine, and travellers say it is still found upon the spot called the Mount of Olives. It is possible that the very tree which once afforded shade to our Saviour may be still living, since there is reason to believe that there are trees now in existence, of which Pliny, who lived near the time of Christ, makes mention.

518. ORDER 2. DIGYNIA; *two* pistils. To illustrate this order we shall mention the *Anthoxanthum*, or sweet-scented spring-grass; this blossoms in May, and when drying, diffuses the pleasant and refreshing smell peculiar to new mown hay. This plant is not classed with the other grasses, which are most v in the third class, because it has but two stamens.

519. ORDER 3d. TRIGYNIA, *three* pistils. We here find the genus *Piper*, the name of which is derived from the Hindoo word *pippul*. It is a climbing plant which is supported upon poles; thus the pepper plantations of the East Indies bear a resemblance to the hop fields of New England. The *Piper Nigrum*, or black pepper, is that species which is most used in commerce, and which furnishes the spice daily used upon our tables. Black pepper was known in commerce in the most remote ages. The Greeks and Romans obtained it from Asia. It has been introduced into the hot region of America; where it grows as well as in its native country.

520. Another species of pepper is the *betel*; the leaves of this plant are used in the East Indies, to enclose slices of a palm nut called the *areca* nut, thus prepared for the purpose of chewing; the natives of that country esteem it a great luxury

517. Describe the Olive.
518. What plant is described under the 2d order?
519. What is described under the 3d order?
520. Of what genus is the betel nut?

using it as Americans do tobacco. Those who have read the *Lady of the Manor*, *Stories on the Church Catechism*, and other works of Mrs. Sherwood, as well as those of other writers on the manners and customs of the people of India, will recollect the *betel nut*.

CHAPTER XXI.

Class 3d—Class 4th.

CLASS III.—TRIANDRIA, *three* stamens.Order 1st, *Monogynia*, *one* pistil.

Fig. 74.



521. This picture represents *two* flowers of this class and order. At *a* is a flower of the genus *Ixia*, (from the Greek *ixios*, blue,) the common name of which is blackberry-lily, though the blackberry-lily common in our gardens is of an orange colour; at *b* is the same flower cut lengthwise to show the three stamens; this is not a liliaceous flower, notwithstanding its common name, as such flowers have six stamens. Fig. 74, at *c*, represents the *Nardus*, or mat-grass: this flower differs from those of the common grasses in having but one pistil.

522. The *Crocus* is among our earliest garden flowers; its name is derived from ancient Mythology, which pretended that a youth of that name was transformed into this plant.

523. The species of crocus called *vernus* (a name which signifies spring) sometimes appears as early as March, and often springs up amidst surrounding snow banks; it is of various colours, purple, straw coloured, yellow, and variegated. This is a bulbous plant, with linear leaves, a spatha calyx, and a corolla of six petals.

524. One species of the *Crocus*, the *autumnalis*, blossoms late in autumn; the large yellow stigmas, furnish the true saffron which is sold by druggists. The plant commonly known among us as the saffron, is a compound flower, and belongs to

521. What does Fig. 74 represent?
522. What is said of the *Crocus* with respect to the derivation of its name?
523. Describe the *Crocus vernus*.
524. Describe the *Crocus autumnalis*.

the class Syngenesia; it is the fine yellow petals of the latter which produce the colour used in dyeing; these possess medicinal properties.

525. The *Iris*, is one of the most common of our garden plants; several species are found in meadows and damp grounds. The common name is *flower de luce*, which is a corruption of the French *fleur de lis*, or flower of the lily.

526. This was formerly the national emblem of France, as the rose was of England. It was adopted in 1179 by Louis VII; after this, some kings of the house of Bourbon began to use upon their seals and coat of arms, three of these flowers.

527. When, on the fall of the Bourbon family, Napoleon became emperor of the French, he adopted the *Roman Eagle* for his emblem. The standard for his army was a gilt-eagle elevated upon a long staff; it appeared seated, and with its wings folded, according to the Roman manner of representing this bold and resolute bird. The American Eagle stands, with outspread wings, as if still soaring aloft, and protecting the striped banner which is below him.

528. After the ruin of Napoleon, and the restoration of the Bourbon family to the throne of France, the eagle was put down, and the *fleur de lis*, or *Iris*, restored to its ancient honours; the friends of the restored Bourbons were every where seen with this flower in the button-hole of the coat.

529. When in 1830, a new revolution drove from France its Bourbon king, Charles X, the *fleur de lis* was again in disgrace, and palaces and public works adorned with this emblem were destroyed without mercy. Some have supposed that the white lily is the national flower of the French, but it is undoubtedly the white *Iris* which is thus distinguished.

530. You will find the *Iris* a curious and interesting plant to analyze, which, after what you have now learned respecting the plant, I hope you will feel induced to attempt. The name *Iris* is so called from *iris*, the rain bow, on account of the variety of colours which this flower reflects. Purple, blue, orange, yellow, and white, are often seen shading into one another in some species. The most common *Iris* is that which is found in marshes, and known by the name of *Blue flag*, and sometimes *Poison flag*.

525. Give an account of the *Iris*.

526. Who adopted this flower as a national emblem?

527. When was the *Roman Eagle* substituted for the *Fleur de lis*?

528. When was the *Iris* restored to its ancient honours?

529. How was the *fleur de lis* regarded after the revolution of 1830?

530. Why is the *Iris* so called?

531. ORDER 2 DIGYNIA, *two pistils*. We here find the important family of grasses, of which there are many different genera. They are distributed throughout the globe, and furnish many of the most useful vegetables for man and beast.

532. Among the most useful of the grass family, are wheat, rye, barley, oats, Indian corn, and rice, besides meadow-grass and those kinds which are eaten by cattle.

533. Indian corn, though it is ranked with the grasses on account of its long and linear leaves, its fibrous roots, and some other particulars, yet it is not placed in the third class, because its stamens and pistils are not in the same flower. Rice is placed in the sixth class on account of the number of its stamens. You see that natural families are sometimes separated by the artificial classification; as in the second class two grasses were mentioned, which were placed there on account of having two stamens.

534. Grasses have fibrous roots, their stems are of that kind called *culms*, being long, slender, and hollow, and having knots from which arises a long *linear* or *lanceolate* leaf surrounding the stem like a sheath.

535. The stems of grasses grow internally, or from the centre outwards; this is the reverse of what appears in the oak, the new wood of which encircles the old.

536. The flowers of the grasses are found in what is called the ear or head; and consist of a calyx of two green husks called a *glume*; within this calyx is the blossom, consisting of a husk of two pieces; these husks are the chaff, which is separated from the seed by threshing. If you observe a blossom of wheat, or of common meadow grass, you will see three stamens with large anthers, and two pistils with feathered stigmas.

537. The grasses have no seed vessel, but the seed is contained within the husks, which gradually open and throw out their contents; this scattering of the seed is the cause of the very general distribution of grasses.

538. Wheat, rye, and oats, are *annual* plants; that is, their roots die every year, and the plant is renewed by means of the

531. What important family do we find in the 2d order of the class Triandria?

532. Which are some of the most useful of the grass family?

533. Why are not Indian-corn and Rice classed with the grasses?

534. What is said of the roots of grasses?

535. What of their stems?

536. What of their flowers?

537. Have the grasses a seed vessel?

538. What grasses are annual, and what are perennial?

seed. The grasses which serve for the subsistence of cattle are mostly *perennial*; though the herbage dies at the approach of winter, the roots live, and are ready to throw out their shoots on the return of spring.

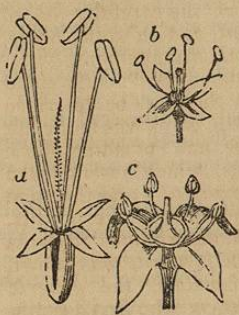
539. Grasses are not recommended for young botanists to analyze, because it is often difficult to distinguish the different genera, as they appear in many respects very similar, and the flowers are not showy like those of many other plants; however, you can easily distinguish the different parts of a bunch of grass, viz.: the fibrous root, the culm-like stem, the long and narrow leaves, and the flowers with their green stamens and pistils.

540. There are some coarse grass-like plants, which grow in bogs and marshes, destitute of those nourishing qualities which belong to the grasses generally; they are known by the name of rushes, sedges, and cat-tails: most of them have their stamens and pistils on separate flowers, and are therefore placed in the class *Monacia*.

CLASS IV.—TETRANDIA, four stamens.

541. ORDER 1, MONOGYNIA, one pistil. This class presents us with flowers of *four stamens* of nearly *equal length*;—there is another class, the 13th, in which the plants have four stamens, but these grow in *two pairs of unequal length*.

Fig. 75.



542. The cut represents at *a* the stamens, pistils, and four leaved calyx, of the common plaintain; at *b*, those of the *Cornus*, or Box-wood; at *c*, is a flower of the *Cissus*, or false grape, its calyx is very small, (not seen in the cut,) the petals are large and bent back, the filaments are shorter than the petals and crowned with large anthers.

543. There is a little pale blue flower which almost every child in New England knows and loves. It is known by different names; some call

539. Are grasses the best flowers for beginners in botany to analyze?

540. What is said of the grass-like plants which grow in bogs and marshes?

541. How does the 4th class differ from the 13th?

542. What does Fig. 75 represent?

it *Innocence*, of which it is no unapt emblem, others term it Forget-me-not; but as the latter name is appropriated to several other flowers, I would recommend the former. This little flower rises but a few inches from the ground; it is surrounded by tufts of leaves clustered around the root; it grows in great luxuriance upon sloping banks, dotting the meadows and sides of rivulets; often appearing in large patches, which form a soft and fragrant bed; it invites the child weary of play to repose on its flowery turf, and thus it becomes associated with recollections of the playful and happy innocence of early days.

544. A lady of New England, who learned Botany at a distance from the scenes of her childhood, though she found a great many splendid and beautiful flowers to examine by the aid of her favourite study, was very anxious to meet with the little pale blue meadow-flower which had flourished in such luxuriance around the home of her infancy; she examined books to find drawings or descriptions of it, and searched the fields for living specimens, but none seemed to answer to the picture in her mind, and she at length gave up the little flower, as a thing of mere fancy, which had mingled with the indistinct recollections of early days. But on returning to her native place, as she was riding out one fine day in spring, a mossy bank appeared to her delighted eye, bespangled with the flower of Innocence, and presenting the very image she had so often driven from her mind as a creation of fancy. She alighted, and after feasting her eyes on the sight once so familiar, and enjoying the freshness of the flowery turf, she carefully placed in a book some tufts of the little plant, and on going home, sought out its name and place in botanical arrangement.

545. The lady saw that it had four stamens of nearly equal length, and one pistil, and that it must therefore be described under the fourth class, first order; the little calyx was four cleft, it supported a corolla having a small tube, and spreading into a flat border with four petal like divisions, which resembled a cross. The little leaves were *ovate* and *radical*; and the stem spread out into small branches, bearing upon them the flowers. Then the lady by examining the different descriptions of plants in this class and order, found that her little favourite was known by botanists by the name of *HOUSTONIA cerulea*,* the *generic* name being derived from Houston, the person who first describ-

* Pronounced *cerulea*.

543. What is said of the flower called Innocence?

544. What is said of a lady who wished to meet with this little flower after she had studied Botany?