

root and pistils on the other. The Yew-tree is an instance of this, and will be found to possess the best flowers to illustrate this class.

## CLASS XXIII.—POLYGAMIA.

The twenty-third class contains plants having some flowers with stamens alone, others with pistils alone, and some complete, *i. e.* with stamens, pistils, and other parts perfect, either on one or more roots, as will be seen in the explanation of the Orders. Example—*Atriplex*, Orach.

## CLASS XXIV.—CRYPTOGAMIA.

This class comprises plants whose parts of fructification in general are very minute and difficult to delineate or describe, and from which circumstance they are called *imperfect* plants; and as the genera in it are very numerous, it almost forms a series of botany distinct from the perfect plants.

The FERNS: as *Polypodium*, Polypody. The MOSSES: as *Sphagnum*, Bog Moss. FUNGI: as *Agaricus*, Mushroom. FUCI: as *Fucus*, Laver and Sea-Wrack, are of this class.

It may not be amiss in this place to caution the reader against consulting flowers which are double, as these will not afford him the opportunity of observing the parts of fructification, and are only to be considered as vegetable monsters formed by luxuriance; in which cases the petals are multiplied in number, by the stamens and pistils putting on the shape of the corolla.

He may also take into consideration three other parts present in the flower not mentioned before: *i. e.* the Receptacle, or base bearing the calyx; the Pericarp, or seed-vessel; and the Seeds. These are considered as forming part of the fruit, and will be of consequence hereafter in the discussing of the following subdivisions; at present it is only to be noticed that such exist.

## ON THE ORDERS,

## OR SECOND SUBDIVISION IN THE LINNEAN SYSTEM OF BOTANY.

From the foregoing pages we learn that the Classes are formed generally on the number and situation of the Stamens; and in a similar manner are the Orders also formed from the Pistils.

The Class MONANDRIA contains two orders.

MONOGYNIA. One Pistil. Example—*Salicornia*, Glasswort; *Caña*, Indian Shot.

DIGYNIA. Two Pistils. Examp.—*Callitriche*, Water Chickweed; *Bitum*, Strawberry Spinage.

DIANDRIA contains also three orders, named from the same: *i. e.*  
MONOGYNIA. Examp.—*Ligustrum*, Privet; *Veronica*, Speedwell; *Circæa*, Enchanter's Nightshade; *Salvia*, Sage.

DIGYNIA. Examp.—*Anthoxanthum*, Sweet-scented Vernal Grass.

TRIGYNIA. Examp.—*Piper*, Pepper.

TRIANDRIA also contains three orders, named from the same.

MONOGYNIA. Examp.—*Valeriana*, Valerian; *Crocus*, Saffron; and *Iris*.

DIGYNIA. Examp.—*Lolium*, Darnel-Grass; *Festuca*, Fescue-Grass; *Triticum*, Wheat.

TRIGYNIA. Examp.—*Montia*, Water-Chickweed.

TETRANDRIA will also be found to contain three orders, the distinctions of which are formed from the same circumstances as the foregoing.

It was observed in our description of this class above, that heed should be taken to distinguish this from the class *Didynamia*; but as the character of these flowers is in some measure distinct, there will be no reason to load the student's mind with any further observation, than that the orders in that class are not formed on the stiles or pistils, but on the seed-vessel.

MONOGYNIA. Examp.—*Dipsacus*, Teazle; *Scabiosa* \*, Scabious; *Plantago*, Plantain.

DIGYNIA. Examp.—*Cuscuta*, Dodder; *Aphanes*, Parsley-pert.

TETRAGYNIA. Examp.—*Sagina*, Pearl-Wort; *Potamogeton*, Pondweed.

PENTANDRIA contains six orders.

MONOGYNIA. Examp.—*Primula*, Primrose; *Convolvulus*, Bindweed; *Lonicera*, Honeysuckle.

DIGYNIA. Examp.—*Gentiana*, Centaury; *Conium*, Hemlock; *Ulmus*, Elm.

TRIGYNIA. Examp.—*Viburnum*, Wayfaring-tree; *Sambucus*, Elder.

TETRAGYNIA. Examp.—*Parnassia*, Grass of Parnassus.

PENTAGYNIA. Examp.—*Statice*, Thrift; *Linum*, Flax; *Drosera*, Sun-Dew.

POLYGYNIA. Examp.—*Myosurus*, Mousetail.

\* This genus may be mistaken by a young botanist for a flower of the class *Syngenesia*; but he will, on consulting the orders of that class, find that the flower of this genus is very distinct, in having four perfect stamens in each, and being set.

HEXANDRIA contains five orders.

MONOGYNIA. Examp.—*Hyacinthus*, Hyacinth; *Convallaria*, Lily-of-the-Valley; *Narcissus*, Daffodil.

DIGYNIA. Examp.—*Oryza*, Rice.

TRIGYNIA. Examp.—*Rumex*, Dock; *Colchicum*, Meadow Saffron.

TETRAGYNIA. Examp.—*Petiveria*, Guinea-Hen-weed.

POLYGYNIA. Examp.—*Alisma*, Water Plantain.

HEPTANDRIA contains four orders.

MONOGYNIA. Examp.—*Trientalis*, Chickweed Winter Green; *Æsculus*, Horse Chesnut.

DIGYNIA. Examp.—*Limeum*.

TRIGYNIA. Examp.—*Saururus*, Lizard's Tail.

HEPTAGYNIA. Examp.—*Septas*.

OCTANDRIA contains four orders.

MONOGYNIA. Examp.—*Epilobium*, Willow Herb; *Erica*, Heath.

DIGYNIA. Examp.—*Weinmannia*, Mountain Chickweed.

TRIGYNIA. Examp.—*Polygonum*, Persicaria.

TETRAGYNIA. Examp.—*Paris*, Herb Paris; *Adoxa*, Moschatel.

ENNEANDRIA contains three orders.

MONOGYNIA. Examp.—*Laurus*, Benjamin-tree.

TRIGYNIA. Examp.—*Rheum*, Rhubarb.

HEXAGYNIA. Examp.—*Butomus*, Flowering Rush.

DECANDRIA contains five orders.

MONOGYNIA. Examp.—*Arbutus*, Strawberry-tree; *Ruta*, Rue; *Pyrola*, Winter-Green.

DIGYNIA. Examp.—*Dianthus*, Pink; *Saxifraga*, Saxifrage; *Saponaria*, Soapwort.

TRIGYNIA. Examp.—*Cucubalus*, Bladder Campion; *Stellaria*, Stitchwort.

PENTAGYNIA. Examp.—*Sedum*, Stone Crop; *Oxalis*, Wood Sorrel; *Lychnis*, Meadow Pink.

DECAGYNIA. Examp.—*Basella*, American Nightshade.

DODECANDRIA contains five orders.

MONOGYNIA. Examp.—*Lythrum*, Loosestrife; *Asarum*, Asarabacca.

DIGYNIA. Examp.—*Agrimonia*, Agrimony; *Heliocarpus*.

TRIGYNIA. Examp.—*Reseda*, Dyers' Weed; *Euphorbia*, Spurge.

PENTAGYNIA. Examp.—*Glinis*.

POLYGYNIA. Examp.—*Sempervivum*, Houseleek.

ICOSANDRIA contains five orders.

MONOGYNIA. Examp.—*Prunus*, Plum; *Myrtus*, Myrtle; *Punica*, Pomegranate.

DIGYNIA. Examp.—*Crataegus*, Hawthorn.

TRIGYNIA. Examp.—*Sorbus*, Mountain-Ash.

PENTAGYNIA. Examp.—*Pyrus*, Quince; *Mespilus*, Medlar.

POLYGYNIA. Examp. — *Rosa*, Rose; *Rubus*, Bramble; *Potentilla*, Cinquefoil; *Tormentilla*, Tormentil.

POLYANDRIA contains seven orders.

MONOGYNIA. Examp. — *Papaver*, Poppy; *Nymphaea*, Water-Lily; *Tilia*, Lime-Tree.

DIGYNIA. Examp. — *Paeonia*, Peony.

TRIGYNIA. Examp. — *Delphinium*, Larkspur; *Aconitum*, Monkshood.

TETRAGYNIA. Examp. — *Cimicifuga*, Bug-bane.

PENTAGYNIA. Examp. — *Nigella*, Devil in the Bush, or Garden Fennel Flower.

HEXAGYNIA. Examp. — *Stratiotes*, Water-Soldier.

POLYGYNIA. Examp. — *Ranunculus*, Crowfoot; *Trollius*, Globe Flower; *Helleborus*, Hellebore; *Caltha*, Water-Marigold; *Adonis*, Pheasant's Eye.

As the classes and orders are thus far distinguished by the number of stamens and pistils, it will be needless to comment further on them in this place, as the plants are easily referred to for comparison in each case.

DIDYNAMIA. The orders in this class are two in number, and are distinguished by the seed-vessel. Thus the first is called

GYMNOSPERMIA, seeds naked, *i. e.* contained in the bottom of the calyx without any covering, as is seen in *Lamium*, Dead-Nettle; and *Scutellaria*, Scullcap. The second,

ANGIOSPERMIA, having covered seeds, *i. e.* growing in a capsule or seed-vessel, as it is to be observed in *Antirrhinum*, Snapdragon; *Rhinanthus*, Yellow Rattle; *Euphrasia*, Eyebright; *Pedicularis*, Lousewort.

TETRADYNAMIA. The orders in this class are named from the seed-vessels, which will require a little explanation. It was observed in the character of this, p. 7, that we referred to this place for a more general description; in which it will not be amiss to state, that the plants of this class form of themselves a natural division, so that it is only necessary for the student to know its character, at once to distinguish it. Thus the bloom of the Cabbage, the Single Wall-flower, or the Radish, will, on inspection, be found to be composed of four petals; the claws of each of which are long, and fixed in a calyx of four leaves which are of considerable length. The limbs of the four petals will be found to form a cross, being regularly placed in pairs opposite each other; and this character is so general, that it induced Tournefort to form them into a natural order, under the name of Cruciform plants.

If the student will only take any flower which is of this class and examine the above character, he will find it so generally to apply, that nothing further, in illustrating this subject, will be found necessary to add to what is given in its proper place.

The name of the first order (of which there are two) is SILICULOSA,

which derives its name from the form of the seed-vessel, *i. e.* a small short pod, called a Silicle. The characters of the orders are as follows—

**SILICULOSA.** A two-valved pericarp, having the seeds fixed along both sutures. It varies in shape, being orbiculate, ovate, or flattened, entire at the end, or emarginate. Examp.—*Myagrum*, Gold of Pleasure; *Iberis*, Candytuft.

**SILICOUSA,** *i. e.* seeds contained in a vessel of a more long description, and which is thus defined:—An oblong membrauceous two-valved pericarp, having the seeds fixed along both sutures. Examp.—*Brassica*, Cabbage; *Cardamine*, Cuckow-flower; *Raphanus*, Radish.

The orders in the class MONADELPHIA will be found to be formed not on the pistil or seed-vessel. But if we consider the character of the class, we remember the stamens are united in a curious manner round the pistil, so as to form a pillar in the centre; and this is subject to so little variation, generally speaking, that we have the character of the class fixed by only considering one flower, *i. e.* the Common Mallow, or the Holyoak; and we need no further example to enable us to form a complete acquaintance with the class. It is also a fortunate circumstance, which facilitates the progress of the knowledge of the orders, that the stamens differing in number enables us to cast the different flowers into their orders at once; the following are the characters that will be found to apply.

MONADELPHIA contains eight orders.

TRIANDRIA. Examp.—*Galaxia*.

PENTANDRIA. Examp.—*Hermannia*, *Melochia*.

OCTANDRIA. Examp.—*Aitonia*.

ENNEANDRIA. Examp.—*Dryandria*.

DECANDRIA. Examp.—*Hugonia*, *Geranium*.

ENDECANDRIA. Examp.—*Brownæa*.

DODECANDRIA. Examp.—*Pentapetes*.

POLYANDRIA. Examp.—*Camellia*; *Hibiscus*, Bladder Ketmia; *Lavatera*; *Malva*, Mallow; *Aleca*, Holyoak, &c.

In the class DIADELPHIA we are not less fortunate in finding an easy indication of our orders. But as this class is composed of the Papilionaceous or Butterfly flowers, whose petals are differently constructed, and which forms a pleasing diversity in the science of classification, I shall, I am sure, render pleasure to the lover of flowers by describing their several parts fully in this place. Thus, if I take the flower of a Pea, I find one large petal, which is fixt on the back of the flower, and which makes a conspicuous appearance; and this we call the *Vexillum*, or Standard: there is also a petal on each side, which are called *Alæ*, or Wings; below which is seen a greenish-white part like the inverted keel of a boat, and called from that circumstance the *Carina*. When this is removed we observe the germ or rudiment of the Pea pod, surrounding which, and apparently connected, are the stamens, one set on one edge and one set on the other; thus forming two brotherhoods—from whence the name of the class.

DIADELPHIA contains four orders.

PENTANDRIA. Examp.—*Monnina*.

HEXANDRIA. Examp.—*Fumaria*, Fumitory.

OCTANDRIA. Examp.—*Polygala*, Milkwort.

DECANDRIA. Examp.—*Spartium*, Common Broom; *Lupinus*, Lupin; *Glycyrrhiza*, Liquorice; *Medicago*, Medic; *Pisum*, Pea.

In the class POLYADELPHIA there are four orders, called from the number of stamens in each set.

PENTANDRIA. Examp.—*Abroma*, *Theobroma*.

DODECANDRIA. Examp.—*Monsonia*.

ICOSANDRIA. Examp.—*Citrus*, Orange-tree.

POLYANDRIA. Examp.—*Hypericum*, St. John's Wort; *Metaleuca*.

The genera in this class are but few; and, in fact, it could easily be dispensed with altogether, as all of the flowers would agree with the class *Polyandria*.

The class SYNGENESIA contains six orders. In this class will be found a difference in structure from any of the preceding, as it will be seen that in some of the flowers composing it the florets are not all furnished with stamens; others that have these parts are destitute of the style or pistil, and consequently, from their being thus incomplete, are barren, and do not produce seed: but this is to be understood to extend only to a certain part of the florets composing a flower; for, notwithstanding this circumstance, it occurs in all the orders after the first; yet there are also perfect florets which will produce seed, so that each plant is renewed from that natural source.

It will be supposed that, if the pupil has paid attention to the characters of the preceding classes and the orders that have become the object of his investigation, he will readily distinguish the parts of which each Syngenesious plant is composed, and necessarily reduce it to its proper place in the system.

The first order, POLYGAMIA ÆQUALIS, has all the florets fertile, and consequently forming a flower completely regular, *i. e.* without the appearance of rays. The Dandelion (*Leontodon*) is an example; also *Sonchus*, Sowthistle; and *Carduus*, Common Thistle. The pappus, or down, on the seeds of this class forms a round head, and makes a beautiful appearance: as all the florets are equally fertile, so is each succeeded by a perfect seed. Examp.—*Scorzonera*, Viper's Grass; *Cichorium*, Chicory; *Onopordon*, Cotton Thistle.

The second order, POLYGAMIA SUPERFLUA, is distinguished by the florets of the disk having perfect stamens and pistils; and those of the radius, pistils only. Examp.—*Anthemis*, May Weed; *Bellis*, Daisy; *Senecio*, Groundsel; *Inula*, Elecampane; *Chrysanthemum*, Ox-eye Daisy; *Gnaphalium*, Cudweed.

The third class is POLYGAMIA FRUSTRANA. The florets of the centre in this order are perfect, and produce seed; and those of the circumference are altogether imperfect, not having any visible parts of fructi-

fication,—of which *Helianthus*, Sunflower; *Centaurea*, Centaury; *Rudbeckia*, are examples. This also wants the calyx.

The fourth order is POLYGAMIA NECESSARIA. The florets of the centre are here furnished with pistils and stamens, and those in the circumference with a pistil only. In this order the seeds are produced from the florets in the circumference; and hence the name of *Necessaria*, from their being required to the reproduction of the species. Examp.—*Calendula*, Starry Marigold; *Othonna*, Arctotis. This also is destitute of the calyx.

The fifth order is POLYGAMIA SEGREGATA. The florets furnished each with a calyx that separates them from each other. Examp.—Globe Thistle; *Echinops* is an example.

The sixth order, MONOGAMIA, contains the flowers which are simple, but were put into this class by Linnæus on account of having their anthers united, as in the Violet. Examp.—*Impatiens*, Balsam; *Lobelia*, Cardinal Flower. Later botanists have disregarded this order, and thrown the plants into the classes where the number of stamens has denoted them. As thus:—Sir James Smith has placed *Viola*, Violet; *Lobelia*, Cardinal Flower; and *Impatiens*, Balsam, in class PENTANDRIA MONOGYNIA.

GYNANDRIA contains nine orders.

DIANDRIA. Examp.—*Orchis*, Ophrys; *Satyrion*; *Cypripedium*, Ladies-Slipper.

TRIANDRIA. Examp.—*Ferraria*, Tiger Flower; *Sisyrinchium*.

TETRANDRIA. Examp.—*Nepenthes*.

PENTANDRIA. Examp.—*Passiflora*, Passion-flower.

HEXANDRIA. Examp.—*Aristolochia*, Birthwort.

OCTANDRIA. Examp.—*Scopolia*.

DECANDRIA. Examp.—*Helicteras*.

DODECANDRIA. Examp.—*Cytinus*.

POLYANDRIA. Examp.—*Arum*, Cuckow Pint; *Calla*; *Pothos*; *Dracontium*.

MONOECIA contains eleven orders, which are also formed from the number of stamens. Some late botanists have reduced this class and the following altogether, and thrown the genera into those classes under which they fall in the system from the number of stamens. Thus in Gmelin's Edition of the *Systema Naturæ*, *Chara* and *Zannichellia*, which were arranged by Linnæus in the first order of MONOECIA, will be found in MONANDRIA. How far this reduction in the number of classes is necessary to the pupil's acquiring a knowledge of plants, I shall not here dispute. One thing may be generally observed, that in the plants of this class the bloom of the different sexes is found at the same time, and there is certainly little difficulty in distinguishing it from any other—Hence it has its natural and obvious distinctions.

MONANDRIA. Examp.—*Casuarina*; *Myristica*, Nutmeg Tree; *Elaeterium*.

- DIANDRIA. Examp.—*Lemna*, Ducks' Meat.  
 TRIANDRIA. Examp.—*Sparganium*, Bur Reed; *Typha*, Bull Rush; *Carex*, Sedge.  
 TETRANDRIA. Examp.—*Aucuba*; *Urtica*, Nettle; *Buxus*, Box-Tree.  
 PENTANDRIA. Examp.—*Amaranthus*, Prince's Feather; *Xanthium*.  
 HEXANDRIA. Examp.—*Zizania*, Pharus.  
 HEPTANDRIA. Examp.—*Guetlarda*.  
 POLYANDRIA. Examp.—*Sagittaria*, Arrow-head; *Juglans*, Walnut; *Corylus*, Nut.  
 MONADELPHIA. Examp.—*Pinus*, Pine; *Thuja*, Arbor Vitæ; *Cupressus*, Cypress.  
 SYNGENESIA. Examp.—*Bryonia*, Bryony; *Iricosantes*, Snake Gourd.  
 GYNANDRIA. Examp.—*Andrachne*.

The class DIOECIA contains fifteen orders.

- MONANDRIA. Examp.—*Natas*, *Pandanus*.  
 DIANDRIA. Examp.—*Salix*, Willow; *Cecropia*.  
 TRIANDRIA. Examp.—*Empetrum*, Crowberry.  
 TETRANDRIA. Examp.—*Hippophaea*, Sea Buckthorn.  
 PENTANDRIA. Examp.—*Humulus*, Hop; *Cannabis*, Hemp.  
 HEXANDRIA. Examp.—*Tamus*, Black Bryony; *Smilax*, Sarsaparilla.  
 OCTANDRIA. Examp.—*Populus*, Poplar; *Rhodiola*.  
 ENNEANDRIA. Examp.—*Mercurialis*, Dog's Mercury; *Hydrocharis*, Frog-bit.  
 DECANDRIA. Examp.—*Kyggelaria*, *Carica*.  
 DODECANDRIA. Examp.—*Menispermum*, Moon-seed.  
 ICOSANDRIA. Examp.—*Flacourtia*.  
 POLYANDRIA. Examp.—*Cliffortia*.  
 MONADELPHIA. Examp.—*Juniperus*, Juniper; *Taxus*, Yew.  
 SYNGENESIA. Examp.—*Ruscus*, Butcher's Broom.  
 GYNANDRIA. Examp.—*Clutia*.

POLYGAMIA contains three orders, formed on the nature of the two preceding classes. Thus:

- MONOECIA. Examp.—*Musa*, Banana-Tree; *Atriplex*, Orach; *Holcus*, Soft Grass.  
 DIOECIA. Examp.—*Panax*, Ginseng; *Fraxinus*, Ash.  
 TRIOECIA. Examp.—*Ficus*, Fig; *Ceratonia*.

CRYPTOGAMIA contains four orders.

- FILICES (FERNS). Examp.—*Asplenium*, Harts-tongue; *Polypodium*, Polypody; *Equisetum*, Horsetail.  
 MUSCI (MOSESSES). Examp.—*Sphagnum*, Bog-Moss; *Bryum*, Hypnum.  
 ALGÆ (SEA WEEDS). Examp.—Liverwort, &c. *Lichen*, *Fucus*, *Conserva*.  
 FUNGI (MUSHROOMS). Examp.—*Agaricus*, *Boletus*, *Lycoperdon*.