

PART III.

INTRODUCTORY REMARKS ON SYSTEM, OR
CLASSIFICATION.

A really natural arrangement of plants, by which is meant an arrangement that should bring together, under particular and positive Classes or Orders, plants agreeing not only in their structure and appearance, but also in their properties; is, in all human probability, that which will never be accomplished.

A belief, however, in this position, ought not to discourage or deter us from striving to render this science as simple as possible; at the same time, the method adopted should approach to the economy of nature as nearly as circumstances will permit.

Among those who have aspired to lead the opinions of mankind in Botanical science, Linnæus has gained a reputation of the highest order; and for a long period, his authority was paramount, and his system followed almost implicitly. It has most undoubtedly great merit, it is pro-

found; but that it is deformed by innumerable blemishes is equally true. It has been one object of this work to give a view of this admired system, divested of one of the most prominent and to our sex the most repulsive of those blemishes which has operated very prejudicially in discouraging the cultivation of a most beautiful, and when properly investigated, a most unexceptionable and improving, study.

According to this celebrated system, (which, with the modifications that have been hazarded,) the reader will find all known plants to be distributed into CLASSES, ORDER, GENERA, SPECIES, and VARIETIES. The advantages of this arrangement are well described by Professor Lindley, who says, "*To acquire the power of referring plants to their places in this system, nothing more is requisite than just so much knowledge of structure as will enable the student to distinguish the one set of organs from the other, to count their number, and to determine to which of the modifications of arrangement they are to be referred. Hence,*" continues the Professor, "*the great popularity acquired by the Linnæan system, and which is at first sight so simple and precise as to leave nothing to be wished for.*"

SYSTEM, OR CLASSIFICATION.

The CLASSES are twenty-four in number, and are formed from the *Number*, the *Place of Insertion*, the *Proportion*, the *Connexion*, the *Disposition*, or the *Absence* of the STAMENS.

The ORDERS, or secondary divisions, are much more numerous: in the first thirteen classes they are founded upon the number of the *styles*, but in the succeeding classes they are subdivided under other circumstances, and which can be more advantageously explained hereafter, under the head of "*Character of Classes, with their orders, &c.*"

It is necessary here to observe that the words *Andria* and *Gynia*, which will now be frequently before us, are derived from the Greek words *Ανδρ* and *γυνη*, man and woman; these, in their respective stations, joined to the Greek numerals, give the definitions by which we recognize the first thirteen *Classes*, as well as the *Orders* into which they are subdivided.

The Greek Numerals.

These being so lavishly used in all botanical works, it becomes necessary to be properly acquainted with them, as well as with their derivation; and it is with this view they are added:

1	Mon	from	monos	one
2	Di	„	dis	two
3	Tri	„	treis	three
4	Tetr	„	tessares	four
5	Pent	„	pente	five
6	Hex	„	ex	six
7	Hept	„	epta	seven
8	Oct	„	octo	eight
9	Enne	„	ennea	nine
10	Dec	„	deka	ten
11	Dodec	„	dodeka	eleven
12	Icos	„	ikosi	twenty
13	Poly	„	polus	many.

It has been seen that Linnæus divided his twenty-four Classes with reference to various particulars. These must now be adverted to, they are nine in number, and are derived as follows:

- 1 As to number of stamens, lengths being equal.
- 2 As to mode of insertion.
- 3 As to proportion.

- 4 As to connexion, or an union of filaments.
- 5 On an union of anthers.
- 6 On disposition, or the place from whence the stamens issue.
- 7 On the separation of stamens and pistils.
- 8 On (what is termed) Polygamy, and
- 9 On concealment.

I. AS TO NUMBER OF STAMENS. LENGTH EQUAL.

<i>No. of Stamens.</i>		<i>Class.</i>	<i>Definition.</i>
1	} Indicates }	1	Mon-andria.
2		2	Di-andria.
3		3	Tri-andria.
4		4	Tet-andria.
5		5	Pent-andria.
6		6	Hex-andria.
7		7	Hept-andria.
8		8	Oct-andria.
9		9	Enne-andria.
10		10	Dec-andria.
12 to 19		11	Dodec-andria.

II. AS TO MODE OF INSERTION.

<i>No. of Stamens.</i>	<i>Inserted.</i>		<i>Class.</i>	<i>Definition.</i>
20, or more.	} On the calyx or } Corolla.	} Indicates }	12	Icos-andria.
20, or more.			13	Poly-andria.

III. AS TO PROPORTION.

<i>No. of Stamens.</i>		<i>Class.</i>	<i>Definition.</i>
2 long, 2 short.	} Indicates }	14	Di-dynamia.
4 do. 2 do.		15	Tetra-dynamia.

IV. AS TO CONNEXION OR UNION OF FILAMENTS.

<i>Nature of the Union.</i>	<i>Class.</i>	<i>Definition.</i>		
The Filaments of stamina being united at the bottom into <i>one</i> body, }	Indicates { 16	Mona-delphia.		
The Filaments of stamina being united at the bottom into <i>two</i> bodies. }			17	Dia-delphia.
The Filaments of stamina being united at the bottom into <i>three or more</i> bodies. }			18	Polya-delphia.

V. ON UNION OF ANTHERS.

<i>Nature of the Union.</i>	<i>Class.</i>	<i>Definition.</i>
When <i>five</i> anthers are united and seated in a tube, it }	Indicates { 19	Syn-genesia.

VI. ON DISPOSITION, OR PLACE FROM WHENCE THE STAMENS ISSUE.

<i>Nature of the Position.</i>	<i>Class.</i>	<i>Definition.</i>
When the stamens grow out of the <i>pistil</i> , or from an elongated receptacle, it }	Indicates { 20	Gyn-andria.

VII. ON THE SEPARATION OF STAMENS AND PISTILS.

<i>Nature of the Separation.</i>	<i>Class.</i>	<i>Definition.</i>
When stamens and pistils are in separate corollas, but yet upon the same plant, it }	Indicates { 21	Mon-œcia.
When stamens and pistils are not only in separate corollas, but are also upon <i>different</i> plants, it }		

VIII. ON WHAT LINNÆUS TERMS POLYGAMY.

<i>Character.</i>	<i>Class.</i>	<i>Definition.</i>
When Bisexual and Unisexual flowers are upon the same plant, or on different plants of the same species, that is, flowers which have both stamens and pistils, the latter of which are in some cases separated from the former, and in others united either on the same plant or on two or three different ones, in such cases	Indicates 23	Poly-gamia.

IX. ON CONCEALMENT.

<i>Circumstance.</i>	<i>Class.</i>	<i>Definition.</i>
If the stamens and pistils being invisible to unassisted vision, and so indistinctly discovered by the microscope as to prevent the plants being referred to any of the foregoing classes, it	Indicates 24	Crypto-gamia.

CHARACTER OF THE CLASSES,

WITH THE ORIGIN OF THEIR ORDERS.

CLASS I.

MONANDRIA—*One Stamen.*

THIS class is subdivided into two orders, viz. Monogynia and Digynia. These orders, (up to the 13th inclusive) as has already been intimated, are founded upon the number of the styles possessed by the plant; those of the first order have only one style, those of the second have two, &c.*

This class (Class I.) has no very high claim to the character of a natural class, since it brings together vegetables very dissimilar in their properties and appearance. It however contains a fine order of plants very nearly allied to each other, comprehending the *Renealmia*, *Amomum*, *Curcuma*, *Thalia*, *Maranta*, *Myrosma*, *Kæmp-*

* See recapitulation of classes with their orders.

feria, *Canna*, *Alpinia*, and *Costus*; the majority of which are aromatic. For an illustration of the class, see Plate 3, fig. 1, *Canna glauca*.

CLASS II.

DIANDRIA—*Two Stamens.*

This class is subdivided into three orders, viz. *Monogynia*, having one style; *Digynia*, having two styles; and *Trigynia*, having three styles.

This, though not a natural class, embraces numerous plants which are considerably allied to each other; such as the *Olea*, *Chionanthus*, *Ligustrum*, *Syringa*, &c.; and also a number of plants, with ringent flowers and naked seeds: such as *Monarda*, *Rosmarinus*, *Salvia*, and others. For an illustration of this class, see Plate 4.

CLASS III.

TRIANDRIA—*Three Stamens.*

This is subdivided also into three orders, viz. *Monogynia*, *Digynia*, and *Trigynia*.* This may

* For explanation, see orders of Class II.

be considered a natural class, though the claim of the first order is, in this respect, inferior to that of the second.

In a medicinal point of view, the class *Triandria* is much less important to mankind than several of the other classes of the system. Nevertheless, it contains some useful articles of the *Materia Medica*, such as the *Valerian*, *Saffron*, different species of the *Iris*, or *Flag*, and the *Tamarind*. For an illustration of this class, see Plate 5, fig. 1.

CLASS IV.

TETRANDRIA—*Four Stamens.*

This class contains androgynous flowers, which are furnished with four stamens, all of an uniform length. It is subdivided into three orders, viz. *Monogynia*,* *Digynia*,† and *Tetragynia*.‡

It has a strong claim to the epithet—natural, having, in its several orders, plants so arranged, not only according to the system of Jussieu, but to the attempted *natural* classification of Linnæus himself. To this class also is attached both a *medicinal* and *commercial* importance, contain-

* Having one style.

† Having two styles.

‡ Having four styles.

ing, as it does, the *Rubia tinctorum*, (common madder.) Several species of *Cornus*; Some species of *Ilex* (Holly), particularly the *Ilex vomitoria*; and the *Cuscuta Americana* (American Dodder), which is extensively employed to dye a yellow colour.

For an illustration of this class, see Plate 5, fig. 2.

CLASS V.

PENTANDRIA—*Five Stamens.*

Its orders are six in number, viz. *Monogynia*,* *Digynia*,† *Trigynia*,‡ *Tetragynia*,§ *Pentagynia*,|| and *Polygynia*.¶

Of a class so extensive it is impossible to treat adequately within the small space which can be spared to the subject in an elementary work; it must, therefore, suffice to state, that the majority of the plants of this class are incorporated into every natural classification yet published or attempted, and that many of them are of the highest value to mankind; such as *Menyanthes*, *Spigelia*, different species of *Convolvulus*,

* Having one style.

† Ditto two styles.

‡ Ditto three ditto.

§ Having four styles.

|| Ditto five ditto.

¶ Ditto many ditto.

Datura Stramonium (Jamestown-weed), *Hyoscyamus* (Henbane), *Nicotiana* (Tobacco), *Chironia* (Centaury), *Solanum* (Nightshade), *Atropa*, *Ignatia amara* (St. Ignatia's bean), *Cinchona officinalis* (Peruvian bark, &c.) *Psychotria emetica* (Ipecacuanha), *Triosteum perfoliatum*, *Gentiana lutea*, *Heuchera Americana* (Alum root), *Conium maculatum* (Hemlock), *Ferula assafœtida*, some species of *Rhus* or *Sumach*, and many others of the most important articles in the *Materia Medica*. In fact, for the purposes of medicine, this is the most important class in the Linnæan system; the Poppy, however, which furnishes us with opium, belongs to another class.

Nature seems to have been fond of introducing into her most active and deleterious families of plants, species of individuals inactive and innoxious; and, on the other hand, into her most inert and most innocent families, species and individuals possessed of active and poisonous qualities. Without entering further upon the consideration of this subject, it may be observed, that no assemblage of vegetables, however natural the arrangement may be supposed, can be shewn to possess one uniform assemblage of like properties.

For illustrations of this class, see the whole of Frontispiece.

CLASS VI.

HEXANDRIA—*Six Stamens.*

In this class the stamens are all of one uniform length; or, at least, there is no determinate inequality in their lengths. It is subdivided into five orders, viz. *Monogynia*, *Digynia*, *Trigynia*, *Tetragynia*, and *Polygynia*.*

It may, with safety, be characterized as one of the most beautiful in the Linnæan system; and, in the scale of utility, it stands above several others; besides which, it has no inconsiderable claim to the character of a natural class.

To the *Materia Medica* it contributes many useful productions. Among them are different species of *Allium*, particularly the *Allium sativum* (Garlic), and the *Allium porrum* (Leek), which, though extensively employed as articles of diet, are also unquestionably possessed of great medicinal qualities; different species of the *Aloe*, (from which the *Aloes* of the druggist's shops is the inspissated juice;) and the *Scilla maritima* (the bulb or root of which is that important diuretic, the Squill.) To this class

* For explanations, see orders of the preceding class.

also belongs that important plant, the *Oryza sativa* (Rice.)

For an illustration of this class, see Plate 6, fig. 1.

CLASS VII.

HEPTANDRIA—*Seven Stamens.*

This class, the most inconsiderable of the twenty-four, is subdivided into four orders, viz. *Monogynia*, *Digynia*, *Tetragynia*, and *Heptagynia*.*

The genus *Septas*, a very singular one, belongs to the last order. The calyx of this plant consists of seven parts; there are seven petals, seven germes, and seven capsules! Only one species of this genus is known, the *Septas capensis*, a native of the Cape of Good Hope.

This class has a very slender claim to the character of a natural one; and the vegetables contained within it have little claim to notice, on the ground of accredited usefulness.

For an illustration of this class, see Plate 6, fig. 2.

- * *Monogynia* having one style.
Digynia — two styles.
Tetragynia — four ditto.
Heptagynia — seven ditto.

CLASS VIII.

OCTANDRIA—*Eight Stamens.*

This class is subdivided into four orders, viz. *Monogynia*, *Digynia*, *Trigynia*, and *Tetragynia*.*

The class, *Octandria*, embraces several natural assemblages of vegetables, namely, *Epilobium*, *Gaura*, *Oenothera*, *Rhexia*, and *Osbeckia*; these plants, among other peculiar characters, have the corolla and the stamens inserted into the calyx. The *Vaccinium* (Whortle-berry), and the immense family of *Erica* (Heath), also belong to this class. Little is known of the medicinal properties of the plants comprehended under the term *Octandria*, but most of them are esculent and wholesome.

For an illustration of this class, see Plate 7, figs. 1 and 2.

CLASS IX.

ENNEANDRIA—*Nine Stamens.*

This class is subdivided into three orders, viz. *Monogynia*, *Trigynia*, and *Hexagynia*.†

* For explanation, see previous orders.

† Hexagynia, having six styles.

The genera which belong to the class Enneandria affords assemblages more or less natural. Among them are *Laurus*, *Anacardium*, *Rheum*, together with *Callitriche*, *Blitum*, *Corispermum*, *Rubex*, *Polygonum*, and several others.

This class, though a very small one, contains a number of important vegetables; for instance, there is *Camphor*, (the produce of the *Laurus Camphora*;) *Cinnamon*, (the produce of the *Laurus Cinnamomum*;) and *Cassia*, (the produce of the *Laurus Cassia*;) there is also the *Laurus Benzoin*; the *Laurus Sassafra*s, (Sassafras;) and the different species of Rheum (Rhubarb).

For an illustration. see Plate 7, fig. 3.

CLASS X.

DECANDRIA—*Ten Stamens.*

It is proper to observe here, that in order to constitute a pure decandrous plant, it is necessary that the ten stamens be distinct from each other, that is, that they be not united together, either by their filaments below, or by their anthers above.

Professor Milne and some other writers have affirmed that the stamens of the plants of this

class must be of an equal length; but this circumstance is not essential to the character *Decandria*; many plants, in which division have their stamens of unequal lengths, as the *Rhododendron*, &c.

The orders of this class are six, viz., *Mono-gynia*, *Digynia*, *Trigynia*, *Tetragynia*, *Pentagynia*, and *Decagynia*.*

The class contains a most numerous and beautiful tribe of vegetables, and at the same time it has strong pretensions to the exhibition of a natural arrangement. In medicine it is by no means unimportant, since we find in it the *Guajacum officinale* (which produces the *Gum-resin Guaiacum*;) the *Tolufera Balsamum* (which furnishes the *Balsam of Tolu*;) the *Myroxylon Peruiferum*, (producing the *Balsam of Peru*;) the *Cassia Senna*, (from which is obtained the *Senna* of the shops;) the *Melia Azedarach*, (which, in *Dr. Durall's inaugural dissertation at Philadelphia* in 1802, is described to be an invaluable anthelmintic;) different species of *Quassia*, (particularly the *Simaruba* and *Amara*;) *Kalmia latifolia*, and *Angustifolia*; *Rhododendron Chrysanthum*, and various others.

For an illustration, see Plate 8, figs. 1, 2, 3.

* Decagynia, having ten styles.

CLASS XI.

DODECANDRIA—*Twelve Stamens.*

It must not be supposed, that all the plants of this class have the precise number of stamens which the name imports. Several of the genera have more than twelve of these organs; whilst others have fewer than the characteristic number. Thus, *Bocconia* has from eight to twelve, or more; *Hudsonia* from ten to fifteen, (generally ten, rarely more than twelve); *Befaria*, fourteen; *Peganum*, *Nitraria*, and others, fifteen; and *Garcinia*, and *Bassia*, sixteen stamens. Some few of the genera have nineteen stamens, and *Agrimonia* has from twelve to twenty.

According to Linnæus, this class embraces those plants having androgynous flowers, and which possess from twelve to nineteen stamens each; but this is not the essential feature of the class *Dodecandria*. The precise character of this class is, that the stamens (or in place of them the anthers), of whatever number, are inserted into the receptaculum, (receptacle.) *By the place of insertion*, we very readily distinguish the plants of this class from those of *Icosandria*; for in this last the stamens are inserted either into the calyx or into the petals. It is to be lamented that it is not so easy to distinguish the plants of *Dodecandria* from those of *Polyandria*

for in both, the insertion of the stamens is the same, and upon investigation it will also be seen that not a few of the plants of Polyandria are to be found which have less than nineteen or even twelve stamens. Dr. Martyn was most decidedly in error, when in his "*Language of Botany*," he asserted that the class *Dodecandria* comprehends "all those plants which have androgynous flowers with from twelve to nineteen stamens inclusive."

From this view of the subject, it must appear evident, that the class *Dodecandria* offers a considerable difficulty to the student in the study of plants, upon the principles of the Linnæan system; but it is not easy to see how this difficulty can be obviated, unless the plan of the learned *Crantz* were to be followed: he proposed to abolish the class *Dodecandria* altogether, and dispose of the genera, (as now arranged,) in different classes, according to the number, insertion, &c. of the stamens; a remedy, it may be feared, more dangerous than the disease.

This class (*Dodecandria*) is subdivided into five orders, viz. *Monogynia*, *Digynia*, *Trigynia*, *Pentagynia*, and *Dodecagynia*.*

The different genera which it contains have very little natural affinity to each other; and it cannot be asserted that the class is a natural one. It is not of much importance in a medicinal point of view.

For illustrations, see Plate 8, figs. 4, 5, 6.

* *Dodecagynia*, twelve styles.

CLASS XII.

ICOSANDRIA—*Twenty Stamens.*

This class embraces those androgynous flowers which are furnished with twenty or more stamens, inserted into the calyx, or into the inner side of the petals. By this last-mentioned circumstance, and not by the mere number of the stamens, is the class *Icosandria*, particularly distinguished from the class Polyandria, which is the next to be treated of.

Many Polyandrous plants are not furnished with more stamens than the plants of the class Icosandria; on the contrary, we find that not a few of the genera which Linnæus has arranged in the 13th class, have constantly fewer than twenty stamens. Here then, we once more enter into the region of supposed difficulties and doubts with respect to the discrimination of the classical characters of the system of Linnæus—and, as a question, it is not unfrequently asked, how are we to distinguish the classes Icosandria and Polyandria?—the answer may be, first, from the circumstance that, in the plants of the class Icosandria, the stamens, whatever may be their number, are inserted into the calyx, or into the sides of the petals; whereas, in the class Polyandria, the

stamens are inserted into the receptacle of the flower ;—there is also another character by which the Icosandrian plants may be distinguished from those of the class Polyandria; and that is, the Icosandria have a concave calyx which is composed of one leaf, to the inner side of which the petals are fastened by their ungues or claws.

This class is subdivided into five orders; viz. *Monogynia*, *Digynia*, *Trigynia*, *Pentagynia*, and *Polygynia*.

The class Icosandria might, with some degree of propriety, be denominated the *Esculent class*, for, in the Linnæan system, there is no class of the same extent to which we are indebted for such a number of fine esculent vegetables of the fruit kind. The fruits of some species of the *Cactus*, or *Indian Fig*, are deemed good eating,—some species of *Eugenia* also afford excellent fruits, but the finest and most substantial fruits of this class are those of the genus *Amygdalus*, comprehending the *Peach* and *Almond*; different kinds of *Prunus*, known by the names of *Plum* and *Cherry*; of *Pyrus*, or *Apples* and *Pears*; of *Mespilus*, or *Mediars*; of *Rubus* or *Bramble*, (such as the *Rubus idæus*, or *Raspberry*, the *Rubus cæsius*, or *Dewberry*;) of *Fragaria*, or *Strawberry*, and others;—we therefore see that although the class Icosandria cannot be said to be a natural class, in the strict sense of the term, yet it cannot be denied, that it embraces several

great assemblages of vegetables which are related by striking family affinities.

To the *Materia Medica*, this class does not give many important articles; some, however, deserve to be mentioned. The genera *Eugenia* and *Myrtus* furnish the *Clove* and *Pimento*; the shells of the *Punica*, or *Pomegranate*, and the root of the *Tormentilla*, or *Tormentil*, are still employed as astringents; and different species of *Geum*, or *Avens*, have acquired some reputation as substitutes for the *Peruvian Bark*.

For an illustration, see Plate 9, fig. 1.

CLASS XIII.

POLYANDRIA.—*Many Stamens.*

The thirteenth class is denominated *Polyandria*, from the Greek word Πολυς, signifying many. This class embraces those vegetables bearing androgynous flowers, and which are furnished with stamens that are inserted into the receptacle of the flower. It has already been observed, that it is by this circumstance, (though it is not expressed in the name of the class,) that the *Polyandrous* vegetables are to be distinguished from those of the class *Icosandria*.

It is said by Linnæus that the number of stamens in this class is generally from twenty to a thousand. It is true that it contains many plants furnished with a number of stamens, far exceeding twenty; such as the *Poppy*, *Capparis*, *Cistus*, *Ranunculus*, and others. But in the class *Icosandria*, there are not a few genera which are as abundantly supplied with these organs; such is the case with the *Cactus*, *Eugenia*, *Rosa*, and others. By attending, however, to the different modes of insertion in the many-stamened plants, we shall have no difficulty in referring them to their proper classes.

From the striking distinction between the two classes, it will be evident how rash and unjustifiable was the innovation made by *Professor Gmelin*, who in his edition of the *Systema Naturæ*, has united the two classes *Icosandria* and *Polyandria* into one, for which he retains the latter name.

The classes in question should be kept apart, not merely in subordinate but as principal divisions, for nature is remarkably regular and constant in the place of insertion of the Stamens. This is referred to for the sake of simplicity, for by uniting or rather confounding the two classes, we render the Linnæan system much more artificial than it really was when it came from the hands of its founder, and we thus deprive it of one

of its advantages, its *occasional* approach to a *natural arrangement*. Notwithstanding the avowedly artificial character of the system of Linnæus, it certainly sometimes presents a natural assemblage; and if this be degenerated, it may be inferred, that in proportion as it is rendered *more* artificial, it will lose a proportionable part of its value.

It has been observed, that the class *Icosandria* contains a great number of esculent and innocent vegetables; now the class *Polyandria* abounds in poisonous vegetables; here is, therefore, another grand difference in the two, and which should alone have been sufficient to prevent the union so injudiciously made by Gmelin.

Whilst, however, the incorporation of the *Icosandria* with the *Polyandria* is highly objectionable, it may be admitted that the latter of these classes might, to a certain extent, be beneficially united with the class *Dodecandria*; all the true *Dodecandrous* plants having more than ten stamens, might be introduced to the class *Polyandria*. This would greatly facilitate the labour of the student; for, after being told that the *Dodecandrous* plants have from twelve to nineteen stamens inclusive, what propriety can he or she discern in the placing under the class *Polyandria* a number of genera in which no botanist, perhaps, has ever observed nineteen

stamens; in which, at least, the number nineteen is exceedingly rare? In *Podophyllum*, *Sanguinaria*, and some other genera, we seldom observe more than fifteen or sixteen stamens.

The class *Polyandria* is subdivided into seven orders; viz. *Monogynia*, *Digynia*, *Trigynia*, *Tetragynia*, *Pentagynia*, *Hexagynia*, and *Polygynia*.

By some writers, this has been deemed a natural class; there is, however, no sufficient reason to consider it as such, though it unquestionably makes nearer advances to the natural, than some other classes. It is one of those which comprehends several pretty natural families of vegetables, that are related to each other by affinities, more or less striking.

Medicinally, the class *Polyandria*, is one of the most important in the Linnæan system; not, however, so much owing to the number of pharmaceutical articles which it affords, as to the value of a few of them. Of these, the most valuable is *opium*.

For an illustration of this class, see Plate 9, fig. 2.

CLASS XIV.

DIDYNAMIA*—*Two-powers.*

In all the preceding classes the orders are founded upon the number of the styles; to this circumstance, however, Linnæus has paid no attention in constructing the orders of this and of the succeeding ten classes. It is worthy of remark that in this, as well as in the classes *Tetradynamia*, *Diadelphia*, and *Syngenesia*, there is no plant to be found with more than one pistil.

The androgynous flowers of the plants in the class *Didynamia*, like those of the fourth class, are furnished with four stamens; but this is the only point of resemblance. In the class *Tetrandria*, as has been observed, the stamens are all of one uniform length, or at least there is no regular inequality between them; whereas in the plants of the class *Didynamia* two of the stamens are constantly long, and two short; they are also disposed in pairs, the outer pair being longer; the middle pair shorter, and their anthers converging or inclining towards each other. This class is subdivided into two orders, viz. *Gymnospermia*

* From *δύς*, twice; and *δύναμις*, power.

and *Angiospermia*; the latter signifying seeds enveloped, the former seeds not enveloped.

Gymnospermia—seed not enveloped: Order 1st.

This order contains those *Didynamous* plants, which are destitute of a proper pericarp, or seed vessel, and have four unenclosed seeds,—an exception however must be made to this rule, the plants *Prasium* and *Phryma*; the former of which has its seeds enveloped in a succulent epidermis, which may, with some propriety, be considered as the pericarp of this plant; in the latter, instead of four unenclosed seeds, we find but one.

Angiospermia—seed, enveloped: Order 2d.

The order *Angiospermia* contains those plants, marked by the *classical* character, but which have their seed lodged in a proper pericarp, or seed vessel.

This is a constant characteristic, and pointedly distinguishes the plants of this order from those of the preceding division. Linnæus has asserted, that the class *Didynamia* is a natural class; and that it contains no genus which does not in strict propriety belong to it. He places the essential characteristics of the class in the circumstance of the plants having four stamens; two of which are long and two short, in their

converging or inclining towards each other, of their possessing but one style, and in the corolla being of an irregular shape ; there is, however, a good reason for denying it to be a natural class, though it certainly approaches to that character much nearer than several others in the Linnæan arrangement ; but the very great affinity existing between the *Diandrous* plants with ringent flowers and the plants of the first order of *Didynamia* will justify a dissent in this instance from the judgment of Linnæus.

The two orders into which this class is subdivided exhibit two vast assemblages of vegetables, each characterized by a set of features which all but exclusively belong to it ; indeed the two orders are so dissimilar, that Dr. Milne says, “it would have been difficult, except from the number and proportions of the stamina, to have reduced them under one head, with any degree of certainty and propriety. The petals, seed-bulb, seed-vessel and seed, are totally different in the two orders ; the habits too, as well as the general appearances of the plants, are perfectly different.”

For an enumeration of the various characters, or features, which shew an affinity of the plants of this class to one another, we must refer the student to that elaborate work, the *Genera Plantarum of Linnæus*.

In a medicinal point of view, this class has little claim to consideration; but from the circumstance that the second order of it embrace a great number of genera, which are named in honour of distinguished botanists and naturalists, a late ingenious writer, Dr. Pulteney, observed that it might “be styled the *apotheosis* of botanists; and Linnæus may be compared to the high priest, who has thus immortalized a numerous group of celebrated men.”

For illustrations of the class Didynamia, see Plate 10, figs. 1 and 2.

CLASS XV.

TETRADYNAMIA*—*Four-powers.*

This class embraces those plants which have androgynous flowers possessing six stamens, four of which are long, and two short. By this character, we readily distinguish the plants of this from those of the class Hexandria. The subjects of these two divisions of the Linnæan method differ widely from each other, as far as regards their aspect or physiognomy; but at the same time it must be allowed, that between their properties there exists a much greater affinity than seems to have been suspected.

* From τεσσαρες, four, and δυναμις, power.

This class is subdivided into two orders, *Siliculosa* and *Siliquosa*, and which are founded upon the circumstance of the form of the pericarp, or seed-vessel. This has been described a species of pod, in which the seeds are alternately fixed to either suture, or joining of the valves.

Siliculosa—*With Silicles*: Order 1st.

The plants of this order are furnished with that particular species of pericarp which we have called *Silicula*, *Silicle*, or little pod, or pouch.

Siliquosa—*with Siliques*: Order 2d.

The plants of this order are furnished with that species of pericarp which has been called *Siliqua*, or *Silique*; and it may be repeated that the *Silicle* and the *Silique* do not essentially differ from each other; they vary only in form and size, in the latter the length greatly exceeds the breadth, as is seen in mustard; the former is almost round, or makes a nearer approach to the orbicular figure; as in *Lunaria* (Honesty), and *Thlaspi* (Shepherd's purse.)

The class *Tetradynamia* is, unquestionably, the best entitled of all in the Linnæan system to the epithet natural. If we except the genus *Cleome*, which is a very irregular family, allied

both to the *Polyandrous* and *Gynandrous* plants, the whole class does not contain a single genus which ought, agreeably to the laws of any *natural* system, to be excluded from it.

All botanists, as Linnæus himself has observed, have perceived the affinity which subsists between the plants of this class; *Morisson, Herman, Ray,* and *Boerhaave*, had, long prior to the publication of Linnæus' writings, denominated these plants *Siliquosæ* and *Siliculosæ*. *TOURNEFORT* has denominated them *Cruciformes*; *HALLER*, *Cruciatae*; and *JUSSIEU*, *Cruciferæ*. *TOURNEFORT* and *HALLER* have disposed of these plants under the two general heads, adhered to by Linnæus; founding their divisions from the same data, viz. the form of the pod.

The terms *Cruciformes, Cruciatae, &c.* were imposed upon these plants, from the form of the Corolla, which has already been noticed at page 112.

The following remarks apply generally to the plants of this class:

Hitherto there has not been discovered any instance of a true tree in the whole class: though some species, however, are shrubby; the root is fibrous, fusiformis, or tuberosæ; few, if any, are furnished with a bulb, in the Linnæan sense of the word: the caulis, or stem, is mostly her-

baceous; the leaves are alternate; they have neither stipules, tendrils, nor prickles: in most species the flowers are disposed in a corymb, which is gradually elongated into a raceme, so that while the flowers are corymbose, the fruit is racemous: the calyx is tetraphyllous, or four-leaved, and in most species deciduous: the petals are four, and, for the most part, unguiculate, or clawed; some few species, however, have flat petals; whilst others (a very rare occurrence,) are entirely destitute of petals. The number and form of the stamens have already been mentioned; but it is necessary to state, there are two or three exceptions; for example, some species of *Lepidium* are strictly *Hexandrous*; that is, there is no regular inequality in respect to the length of the stamens. The *Cardamine Hirsuta* has frequently no more than four stamens, the two shorter ones being deficient. In the *Cleome*, the number of the stamens is very various. The fruit is two-valved, and two-celled, and generally contains many seeds; but in two instances, viz. in the *Isatis* and *Crambe*, the fruit contains but a single seed. The general properties of the *Siliquose* plants are well known; they have an acrid, lixivial taste, which in some species, whilst growing in their wild state, is very powerful; as is experienced in the *Cochlearia Armoracia* (Horse-radish), and the

Sinapis (Mustard). Even the turnip, upon naturally wet ground, contracts a remarkable acrimony.

It would seem, indeed, that the properties of the *Tetradynamous* plants are more remarkably and speedily influenced by the soil and climate in which they grow, than any other class of plants, the *Umbelliferae* not excepted.

The class *Tetradynamia* is, upon the whole, a very important one, since it furnishes several alimentary articles, which are highly useful: such as the Turnip, the different varieties of Cabbage, &c.: it likewise affords many stimulating articles, such as Mustard, Horse-radish, &c. which are used as *condiments*. To the resources of the healing art it contributes little; but, on the other hand, it contains few plants of a poisonous quality, perhaps none, if we except the seeds of the *Raphanus*, and *Raphanistrum* (White Charlock).

For illustrations of the class *Tetradynamia*, see Plate 11, fig. 2.

CLASS XVI.

MONADELPHIA* — *One Brotherhood; or
Filaments united into a Cylinder.*

This large and interesting class comprises those vegetables having androgynous flowers, and which have all their stamens united below, that is, by their filaments, into one body, or cylinder, through which the pistil passes. This class is a natural one, and the best proof of this, is the fact, that almost every botanist, in pursuit of a natural method, has associated under one head, the greater number of the *Monadelphous* plants; though they have constructed their systems upon principles very different from those of LINNÆUS. The vegetables of this class have, in general, permanent calyx, which, in many of the genera, is double; though, more frequently, it is single. It is double in *Malva*, *Alcea*, &c.; single in *Gordonia*, *Morisonia*, *Stewartia*, *Adansonia*, and others.

The petals are five in number, and are somewhat heart-shaped, closely embracing each other

* From *μονος*, one, or alone, and *ἀδελφία*, a brotherhood.

above, so as to assume the appearance of a single petal. Tournefort considered many of the *Malvaceous* plants to be monopetalous; but the corolla is, unquestionably, polypetalous, although the petals, when they fall, cohere together, which is owing to the intimate connexion which subsists between the filaments and the petals. The petals, indeed, appear to be a continuation of the filaments, or the filaments a continuation of the petals. The filaments, as has been observed, are united into a body, or cylinder, below, but are detached above: the anthers are lightly attached to the filaments, by the middle: the receptacle, or that part to which the flower and the fruit are attached, is prominent in the centre of the flower, and the seeds are kidney-shaped.

The subjects of the class *Monadelphia*, vary much in size. It comprehends some of the smallest vegetables known to us, and many of the most stupendous trees that have hitherto been discovered. Thus, some of the creeping Mallows (*Malva rotundifolia*, &c.) seldom arrive to the height of six inches: whilst the Silk-cotton tree (*Bombax pentandrum*), is so large, and spreads its branches so widely, that, according to William Bosman, a whole brigade might be manœuvred under its shade, without inconvenience. This vast vegetable is a native of Africa and South America. The *Adansonia*

digitata (Ethiopian Sour gourd), is another magnificent tree; it is a native of Senegal, in Africa, and is known to acquire the diameter of twenty-five feet, that is, seventy-five in circumference; in proportion to its bulk, so is its age. In the year 1749, the learned Mr. Michael Adanson saw two of these trees in the neighbourhood of *Goree*, upon one of which was inscribed the date of the fourteenth, and upon the other that of the fifteenth century! Yet, there was good reason to suppose, that the trees were not young when the dates were cut. It may therefore be conjectured, upon very plausible grounds, that these trees sometimes attain the age of eight or nine hundred years: an immense period for the existence of any species of organized bodies!

The class *Monadelpia*, is by no means the least important in Linnæus' system. It furnishes us with many valuable articles; for instance, the different species of *Gossypium* (Cotton), are subjects of this class: the species which is at present cultivated with so much success in the *United States of America*, and with so much emolument to that country, is the *Gossypium herbaceum*, a native of the *East Indies*.

To the *Materia Medica* this class gives few important articles; but, from the mild mucilage with which they abound, there can be little.

doubt that many more of the *Monadelphous* plants might be used with great advantage as articles of diet, than are at present made subservient to the supply of our wants in this respect.

The *Orders* of the class *Monadelphia* are nine in number, and are founded upon the number of stamens; in conjunction, as already stated, with the union of the filaments into a cylinder. The names of these *Orders*, with the exception of the seventh, are the same as those of several of the preceding classes; namely, *Triandria*, *Pentandria*, *Heptandria*, *Octandria*, *Enneandria*, *Decandria*, *Endecandria*, *Dodecandria*, and *Polyandria*.

For an illustration of the class *Monadelphia*, see Plate 11, fig. 2.

CLASS XVII.

DIADELPHIA—*Two Brotherhoods; or Filaments united into Two Cylindrical sets.*

The class *Diadelphia*,* contains those plants having androgynous flowers, which have their

* From *δύς*, twice; and *ἀδελφος*, a brother.

stamens united below into *two* sets of cylindrical filaments. So much, at least, is implied by the name of the class; but, unfortunately, the student will often find that a plant which Linnæus has referred to this great section of his system, has, strictly speaking, only one set of united filaments. In many of the genera, the stamens are all united; that is, all into one set, generally with a slit down the upper side of the tube; these really are not *Diadelphous*, but *Monadelphous*, and are great stumbling-blocks to beginners. It is but just to add, in the words of Dr. Milne, "That the names given by former botanists to the numerous class of plants in question, are much more characteristic of their nature and appearance than that of *Diadelphia*. In fact, the figure of the flowers and the fruit of the vegetables of this class never varies, the latter being always of the pod-kind; the former of a butterfly shape. On the other hand, it is again to be lamented, that the two sets of united stamina, the only classic character expressed in the Linnæan title, are never to be traced without difficulty; for one of the sets only is properly united; the other consists of a single filament, which, in most plants, adheres so closely to its kindred set, that it cannot be separated without the application of some sharp-pointed instrument for that purpose.

In some, even no separation can be effected by this means.”*

The *Orders*, or secondary divisions of the class *Diadelphia*, are founded on the number of the stamens, considered as distinct, and are as follow:—*Pentandria*, *Hexandria*, *Octandria*, and *Decandria*.

These plants correspond to the *Leguminosæ*, (or plants having legumes,) of MORISON, HERMANN, BOERHAAVE, RAY, and ROYEN: the *Tetrapetali irregularcs* of RIVINUS and CHRISTOPHER KNAUT: the *Tetrapetali difformes* of Christian KNAUT; and the *Papilionacei*, or Butterfly-shaped flowers, of TOURNEFORT and PONTERERA. The *Diadelphous* plants are also arranged by LINNÆUS in his thirty-second *natural order*, *Papilionaceæ*; and by MONSIEUR DE JUSSIEU, in his vast order *Leguminosæ*, the eleventh of his fourteenth class.

The class *Diadelphia* is, in several respects, one of the most important classes; for it embraces a considerable number of vegetables, which constitute valuable articles of food to man, and other animals. The seeds of some of these, such as various species of *Pisum*, *Phaseolus*, *Dolichos*, *Lathyrus*, and *Vica*, are among the number of

* Milne's Botanical Dictionary, &c., article, *Diadelphia*.

the most nutritious articles with which we are acquainted. In these the farinaceous matter is combined with a large portion of essential oil, and the saccharine principle, or sugar; hence, they contain three of the most nutritious principles of vegetable matter.

This class also furnishes some very valuable medicines; the principal of the plants from which they are derived belong to the genera *Fumaria*, *Polygala*, *Glycyrrhiza*, *Galega*, and the *Geoffroya*. Many others might be mentioned; this class also affords some very important *Plantæ tinctoriæ*, or dying plants; such as the *Indigofera tinctoria*: from the leaves and small branches of this vegetable, which is a native of *India*, is prepared that valuable dye which is so well known by the name of *Indigo*. The leaves, &c. of the *Podalyria tinctoria* (Wild Indigo), yield a coarse violet-coloured *fecula*; the branches of *Genista tinctoria* (Dyer's Broom), are employed to give a yellow colour; and from the leaves of the *Coronilla emerus* (Scorpion Senna), a dye is procured from precipitation, after the acetous fermentation has taken place.

For an illustration of the class *Diadelphia*, see Plate I2, fig. 1.

CLASS XVIII.

POLYADELPHIA—*Many Brotherhoods.*

This class embraces those plants having androgynous flowers, and which have the stamens united by their filaments into three, or more, distinct bundles.

The Orders of this class are founded upon the number of the stamens, in conjunction with the peculiar mode of union above adverted to, and are called *Pentandria*, (having five stamens;) *Dodecandria*, (twelve stamens;) *Icosandria*, (twenty or more stamens;) and *Polyandria*, (many stamens.)

The class *Polyadelphia*, has but little claim to the character of a natural one; according to Dr. J. E. Smith, “it is both small and unnatural,” though we find many of its genera arranged in the different natural orders of botanists, who dissent from the system of Linnæus.

As this is one of the smallest, so it is also one of the least important classes in the Linnæan arrangement; nevertheless, it furnishes us with some vegetables, which those who are devoted to the luxuries of the palate would be unwilling to forego. That highly nutritious and agreeable

article, *Chocolate*, is prepared from the nuts of the *Theobroma Cacao*, a native of *South America*. Linnæus, it has been observed by Mr. Pennant,* must have been much attached to the use of this article, as he has given to it a name which imports nothing less than “the food of the gods.”† The different species of the *Citrus Aurantium* (Orange), and the *Citrus Medica* (Lemon), are also among the finest and most wholesome fruits that have hitherto been discovered.

From a species of the genus *Hypericum Bacciferum*, a native of India, we obtain one of the varieties of *Gamboge* that are in use; except this, we obtain no indispensable or even slightly important medicinal article from the class *Polyadelphia*.

For an illustration of this class, see Plate 12, fig. 2.

* An American.

† *Theobroma*, from θεός, God; and τροφή, food.

CLASS XIX.

SYNGENESIA*—*Confederate Anthers.*

This vast class comprehends those plants having androgynous flowers, in which the anthers are, in a majority of cases, united into a cylinder, whilst the filaments, by which they are supported, are separate and distinct.

The *Orders* of this very extensive class of plants arise from the proximity or remoteness of the florets composing the inflorescence, and which are contained within a common calyx, † respectively producing both stamens and pistils; stamens and pistils occupying separate and distinct corollas: corollas destitute alike of one or both of these organs; and corollas miscellaneously and irregularly occupying or possessing one, both, or neither of them. This class has been denominated by Linnæus, *polygamia Florum*, and so far as the indiscriminate and irregular association of stamens with the pistils is concerned, it characterizes the Linnæan analogical method most faithfully. It is difficult

* From the Greek *συν*, sun, together; and *γενεσις*, genesis, birth.

† Perianthium commune.

to decide satisfactorily between the claims of Linnæus and some other writers; but the severe truth appears to be, that although the last of the orders of this class, as appropriated by Linnæus, is open to exception; the previous five have a title to be retained, each of them manifesting a great uniformity of structure.

In the formation of the orders of this class, Linnæus has followed out his favorite hypothesis and analogies to an unusual extent; but, with the exception of the 6th Order, there is no great reason to differ from him.

THE SUBDIVISIONS OR ORDERS ARE MADE AS FOLLOW ·

- | | | |
|------|-------------|----------------|
| 1st. | Association | Æqualis. |
| 2d. | „ | Superflua. |
| 3d. | „ | Frustranea. |
| 4th. | „ | Necessaria. |
| 5th. | „ | Segregata, and |
| 6th. | „ | Monogamia. |

FIRST ORDER.

Association Æqualis—Equal.

IN the plants which form this order, the florets, or partial flowers, are all androgynous;

that is, each is furnished with both stamen and style; hence the term, *equal*. Most of the flowers of this order are furnished with the ligulate or strap-shaped Corolla; in a few instances they have the radiate Corolla.

SECOND ORDER.

Association Superflua—Superfluous.

In the plants of this order, the florets, in the centre of the disk, are androgynous; while those of the circumference, margin, or radius, are destitute of the stamens, but possess the style. The term superfluous is given to this species, because the fructification may be perfected by the florets of the centre alone, and without the assistance of the pistilliferous florets of the radius.

THIRD ORDER.

Association Frustranea—Frustraneous.

In this order we find the hollow florets in the centre of the flower to be furnished with both the stamens and style, while the flat florets in the radius, or circumference, are destitute of both; from this circumstance Linnæus considered

they may frustrate the capabilities of the androgynous flowers of the centre; an opinion not philosophical, but hence is the name of the order derived.

FOURTH ORDER.

Association Necessaria—Necessary.

In the plants of this order, the florets of the centre are furnished with stamens, while those of the radius are merely supplied with the pistil. By reason of the florets of this order not being androgynous, the order is termed necessary, because each of the florets possess one or other of the organs necessary to reproduction.

FIFTH ORDER.

Association Segregata.*

In the greater number of the plants of this order, the florets are androgynous; separated from each other by means of partial flower-cups, or perianths, which support one or more florets; these are then found to be collectively placed

* *Segregata*, literally means separate.

within a common Calyx, or Perianth. But for these circumstances it would be only a modification of the 1st and 4th orders, and the name which it bears would appear anomalous.

SIXTH ORDER.

Monogamia, Monogamy.

The 6th and last order contains simple flowers, in which respect it differs from all the preceding orders, the flowers of which are truly compound. In fact, the genera which Linnæus has referred to the order *Monogamia*, are so essentially different in their structure and in their aspect, from the plants of the preceding five orders, that Dr. Milne* has said, with much truth, that "Linnæus has offered a manifest violence to *Nature* by forcibly tearing many genera of plants from their proper places, and incorporating them with others, which are of a different and even opposite nature. In fact," continues Doctor Milne, "of all the numerous systems of botany there is not a single character which wounds nature so cruelly as that of Linnæus in this instance."

This criticism, unfortunately, is not too severe.

* See his Botanical Dictionary, article *Syngenesia*.

It must not, however, be supposed, that Linnæus has mixed and confounded the simple flowered plants of the order *Monogamia* with the compound flowers of the preceding orders of the 19th class, without having proceeded upon a rule of apparent consistency.

The name of the class *Syngenesia*, imports an union of anthers, or summits of the stamens; this may be said to be the classical character of the great body of plants thus associated.

So attentive, indeed, was Linnæus to this circumstance, that he has detruded from its proper place, among the compound flowers, a particular genus, that of *Kuhnia*, merely because the anthers of this plant are distinct; and has thrown it into the class *Pentandria*, where it is no less strangely associated than are the genera *Impatiens* (Balsam), *Lobelia* (Cardinal flower), &c., with the compound flowers of *Syngenesia*.

But it is not true that the anthers of all the plants which Linnæus has referred to the order *Monogamia*, are united into a cylinder; the anthers are separate in many species of *Lobelia* and *Violet*. Again, in some species of *Solanum*, or *Nightshade*, and in other genera, which are referred by Linnæus to the class *Pentandria*, the anthers are actually connate, or united into a cylinder!

Some of the warmest admirers of Linnæus, and those who have manifested the least disposition to innovate his system, have been obliged to forsake him in the arrangement of the genera which he has referred to the order *Monogamia*: thus, Dr. J. E. Smith, though he retains all the classes of Linnæus, has, with great propriety, abolished the last order of *Syngenesia*, and referred the genera which it contains to the first order of *Pentandria*.*

The class *Syngenesia*, with the exception of the order *Monogamia*, is a natural assemblage of plants. It embraces the great family of compound flowers, which is, unquestionably, a natural tribe, essentially distinct from the plants with simple flowers. The essence of these compound flowers is said, by Linnæus, to consist in the two circumstances of the union of the anthers into a cylinder, and a single seed placed below the receptacle, and attached to each floscule. The greater number of these plants are furnished with a common Calyx, or Perianth. In *Echinops*, however, the common Calyx is wanting; but it is present in *Scabiosa*, a plant which Linnæus does not consider a true compound flower.

In the majority of cases the compound flowers

* See Dr. J. E. Smith's *Flora Britannica*, a work of great merit.

are furnished with a common receptacle, but *Milleria*, one of these plants, is destitute of this; while, on the other hand, we have proofs of its existence upon *Scabiosa*, *Teasel* (Dipsacaceae), and *Globe-flower* (Gomphrena), although neither of these plants is referred by Linnæus to the arrangement of compound flowers.

Tournefort, Vaillant, and many other eminent botanical writers before Linnæus, had sought for the essential character of the compound flowers, in the presence of a common Calyx, and a common receptacle: but Linnæus rejected both of these as inadequate to the purpose, and, in their place, substituted the union of the anthers, and the situation of the seeds. In accordance with what was formerly advanced, it must be conceded that Linnæus, in having adhered thus *exclusively* to these characters, offered violence to nature.

The true Syngenesious plants are, compound flowers, consisting of a number of individual floscules, or florets. The following features constitute the principal natural character of such a floscule.

The Calyx is a corona seminis, or aigrette, sitting upon the apex of the germe.

The Corolla is monopetalous, furnished with a long and very narrow tube, sitting upon the germe.

This Corolla is,—

1st. *Tubulata*, tubulate, campanulate, or bell-shaped, quinquifid, laciniaë, reflex, and spreading.

2d. *Ligulata*, ligulate, or strap-shaped; the limb, more properly border, linear, flat, turned outwards, dentate, and truncated.

3d. Possessed of the limb or border, and very rarely destitute of the tube.

The stamens, in the greater number of the species, are five in number: they are capillary, very short, and inserted in the neck of the corolla. The anthers are, also, five in number: they are linear, erect, cohering, by their sides, into a cylinder, which is quinquedentate, and of the length of the limb or border. In regard to the pistil: the germe is oblong, placed below the corolla, and above the common receptacle. The style is filiform, erect, of the length of the stamens, and perforates the cylinder formed by the anthers. The stigma is bipartite; the segments are revolute and spreading. These plants are destitute of a true pericarp, though in some of the genera, as in Bone-seed (*Osteospermum*), and *Strumpfia*, the seeds are enveloped in a coriaceous crust, and are oblong, often four-cornered, and frequently narrowed at the base.

Independently of their compound flowers, there is something in the aspect of the *Synge-*

nesious plants which emphatically distinguishes them from all others. It is not easy indeed to determine in what this peculiar character consists. Sir John Hill says, that these plants "have a weed-like appearance." There is considerable truth in this observation, for notwithstanding the beauty of their flowers, the prevailing colours of which are yellow and orange; the stems and the leaves, of a very great number, are rough and downy; and a spectator is induced to say of the class generally, "it has been less reclaimed from its wild or savage state than most other plants," with the exception of those of the 24th class.

The class *Syngenesia* is, in many respects, an important one. It furnishes us with many beautiful plants, and with not a few articles of diet and of medicine. Among the former may be named the *Common Garden-Lettuce* (*Lactuca sativa*); and a great many of the *Semifloscular* plants of the first order, also, are esculent. It is somewhat remarkable that, although the lactescent plants, or plants abounding in a milky juice, of the other classes are very poisonous, the milky plants of *Syngenesia*, with a very few exceptions, are entirely innocent. This circumstance will show the propriety of receiving, with hesitation, those general canons which have been proposed by the medical writers respecting the properties of plants, as deduced from their

general aspect or obvious qualities. Nevertheless, the general rule of Linnæus ought to be remembered, viz. "*Plantæ Lactescentes plerumque Venenatæ sunt.*"*

As medicinal plants, the *Common Dandelion*, (*Leontodon teraxacum*), a species of *Lettuce* (*Lactuca virosa*), and some species of *Serratula* and *Eupatorium*, are entitled to consideration. The famous *Chamomile* of the shops, is the *Anthemis nobilis*. Coltsfoot and Wormwood are also within the arrangement of this class.

For an illustration of the class *Syngenesia*, see Plate 13.

CLASS XX.

GYNANDRIA.†

This class contains those androgynous flowers, the stamens and pistils of which are situated upon, and supported by a pillar-shaped re-

* In general, the lactescent plants are poisonous.

† From the Greek words *γυνή*, woman, and *ανηρ*, man; a derivation in no way accordant with the characteristics of the class; the term *columnifera* would have been preferable.

ceptacle, something resembling a style, and which rises in the centre of the flower.

The orders of this class are founded upon the number of the stamens. Linnæus has subdivided the whole class into nine orders, viz. *Diandria*, *Triandria*, *Tetrandria*, *Pentandria*, *Hexandria*, *Octandria*, *Decandria*, *Dodecandria*, and *Polyandria*.*

In this subdivision most botanists who have retained a distinct class by the name of *Gynandria* have followed Linnæus. But the learned Professor Swartz, who devoted very particular attention to these plants, has shown, that what has generally been taken for *two* anthers, is nothing more than a *single anther bilobated*, or consisting of two lobes; and, consequently, that the greater number of the genera which Linnæus has thrown into the 1st order, (*Diandria*), of this class, ought to be referred to the order *Monandria*; this is so evident that no one can doubt the propriety of considering the additional subdivision an improvement upon the Linnæan system.

This has been called “an odd and miscellaneous class;” it has not, indeed, much claim to the character of natural arrangement, although

* For explanations see the Greek numerals, p. 168, and remark in third paragraph, p. 167.

Linnæus deemed the order *Diandria* to be a very natural assemblage of plants.

In regard to the properties of the *Gyandrous* plants, it may be observed, that many supply extremely nutritious articles: thus, the salep of the shops is the produce of the *Orchis morio*; and it has been shown, that from the bulbs of other species a very good salep might be produced. The properties of other genera of this class are very dissimilar, containing, as they do, a number of very active plants. The genera *Arum*, *Dracontium*, *Pothos*, and *Calla*, are acrid vegetables. The properties of the *Arum triphyllum* (Indian turnip), has received considerable attention; the fresh roots of it being boiled in milk, and thus taken for some time, has been found useful in consumption of the lungs. The *Aristolochia Serpentaria* (Virginia snake-root), is a medicinal article of great value. The pods of the *Epidendrum Vanilla*, of Linnæus (*Vanilla aromatica* of Swartz), have a very agreeable taste and smell; and are included among the articles in the *Materia Medica* of the *Mexicans*, under whose authority they enter into the composition of chocolate.

For illustrations of the class *Gynandria*, see Plate 14.

CLASS XXI.

MONŒCIA.*

The twenty-first class of the Linnæan system is essentially distinguished from all the preceding classes. It embraces those vegetables in which the stamens and the styles are placed apart; that is, within distinct covers (calyx or corolla, or both), but upon the same plant or individual. This peculiarity of disposition led Linnæus to name this class *Monœcia*; and although many single species, ranged under some of the preceding classes do, in strict propriety, belong to the class *Monœcia*, yet it is manifest that the flowers of the plants under consideration are not androgynous, as are the flowers of the plants of the preceding twenty classes; nor are the stamens and the styles, respectively situated upon distinct individuals of the same species, as is the case in the next (22d) class, or *Diœcia*.

The orders of this class are eleven in number; and, by Linnæus, are founded upon the circumstance of the *number*, the *union*, and the situation of the stamens, and are distinguished by the names

* From the Greek of *μονος*, alone; and *ὄνκια*, a house or habitation.

of some of the preceding classes, viz. *Monandria*, *Diandria*, *Triandria*, *Tetrandria*, *Pentandria*, *Hexandria*, *Heptandria*, *Polyandria*, *Monadelphia*, *Syngenesia*, and *Gynandria*. The last has been (by Dr. J. E. Smith) justly denominated "a paradoxical order." How, indeed, can a plant belong to the class *Monœcia*, the character of which is to have the anthers and pistils in different covers of the same vegetable, and yet answer to the character of the class *Gynandria*, the peculiar feature of which is to have the anthers attached to the pistil, within the same calyx or corolla?

For an illustration of the class *Monœcia* (order *Polyandria*), see Plate 15.

CLASS XXII. .

DICÆCIA* — *Two Houses*.

This class contains those plants which have *no* androgynous flowers, but produce the stamiferous and pistiliferous flowers on distinct individuals of the same species. Thus the

* From the Greek *δύς*, twice, and *δικα*, a house.

character of the class *Diœcia* is essentially different from that of any of the preceding classes: for, in the first *twenty*, the flowers are all androgynous; and, in the twenty-first, separate corollas, seated upon different parts of the same plant, produce respectively the stamens and pistils: but in the class now under consideration, the same individual does not sustain either collective or distinct flowers possessing both the organs.

The orders of the class *Diœcia* are fifteen in number, and are founded upon the circumstances of the number, the union, and the situation of the stamens; and of course upon the same principle as the orders of *Monœcia*; they are as follow: *Monandria*, *Diandria*, *Triandria*, *Tetrandria*, *Pentandria*, *Hexandria*, *Octandria*, *Enneandria*, *Decandria*, *Dodecandria*, *Icosandria*, *Polyandria*, *Monodelphia*, *Syngenesia*, and *Gynandria*.

From a variety of circumstances this may be considered a natural collection of plants; Linnæus, as well as Jussieu, having arranged the genera of this class under the various orders of their respective natural systems.

The medicinal properties of the plants under consideration are not numerous; but the barks of different species of *Salix* and *Populus* have been found good substitutes for the Peruvian

bark; *Myrica* (Candleberry Myrtle), and *Viscum* (Mistletoe), have, likewise, been used as tonic medicines. The Sarsaparilla of the shops (an article of no great value,) is the root of the *Smilax Sarsaparilla*; a species of *Aralia Nudicaulis* (of Linnæus), is also called Sarsaparilla, and is frequently found in the shops, where it is sold for the genuine kind; to these may be added the berries of the *Juniperus Communis* (common Juniper), and the *Juniperus Virginiana* (Red Cedar); the powers of the latter being but little inferior to those of the former.

That important article *Humulus Lupulus* (common Hop), also belongs to this class.

It is a circumstance peculiar to the plants of the classes *Monœcia* and *Diœcia*, that the stamens and pistils make their appearance before the full evolution of the leaves, so that the farina or pollen of the *Anthers* may be carried more securely by the winds, or may be more directly deposited by their own gravity on the pistilliferous flowers; this is known to be the case in the Mulberry, Mistletoe, Alder, Birch, Hornbeam, Beech, Oak, Hazel, Walnut, Willow, Sea Buckthorn (*Hippophæ*), Dutch Myrtle (*Myrica*), Poplar, and the Dog's Mercury (*Mercurialis*.)

For illustrations of this class, (see Plate 16.)

CLASS XXIII.

POLYGAMIA.

This is a very extraordinary class; it is, to use Dr. J. E. Smith's words, also "a bad and unnatural class, variable and obscure."

In order that a plant should belong to it, it is absolutely necessary that some of its flowers should be androgynous; whilst, in addition, it may possess stameniferous, or pistilliferous flowers, or both; and these too may appear on one, two, or more plants or individuals.

The following are the various modes in which the association of the plants of this class are recognised, viz.

1st. Androgynous flowers, and flowers having stamens only, situated upon the *same* plant, as in White Hellebore (*Veratrum*), and others.

2d. Androgynous flowers, and flowers having stamens only, situated upon *distinct* plants or individuals, as in Ginseng (*Panax quinquefolium*), and others.

3d. Androgynous flowers, and flowers having *pistils* only, situated on the *same* plant or

* From *πολυς*, many, and *γαμος*, marriage or association.

individual, as in Pellitory (*Parietaria*), and Orach (*Atriplex*.)

4th. Androgynous flowers, and flowers having pistils only, situated upon *different* plants or individuals, as in many species of *Fraxinus*, or Ash-tree.

5th. Androgynous flowers, flowers having stamens only, and flowers having pistils only; each of these occupying *a distinct* individual, as in *Ceratonia* (Carob-tree,) and *Ficus* (Fig-tree.)

6th. Androgynous flowers, flowers having stamens only, and flowers possessing pistils only, situated upon *two distinct* plants or individuals, as in *Gleditsia Triacanthos* (Honey-Locust); in this instance we find the stameniferous and androgynous flowers placed upon one plant or individual, and the pistilliferous flowers upon another.

7th. This mode of association is termed *Frustranea*, from its flowers, although containing both stamens and pistils, having, at the same time, one of them abortive; in some, the stamens; in others, the pistil. We have an instance of this singular mode of association in the flowers of the famous Banana-tree (*Musa Sapientum*), whose striking name (the *Tree of Knowledge*), has excited so much curiosity.

The class of *Polygamia* is subdivided into

three orders, viz. *Monœcia*,* *Dicœcia*,† and *Triœcia*.‡

A very considerable number of the plants which Linnæus has thrown into his classes of true androgynous flowers, do occasionally bear, beside those, flowers merely with stamens, or with pistils. It may be suspected, therefore, that if we were compelled to adhere with un-deviating obedience to the Linnæan rule, we should hardly find one very extensive genus of the system, in which some one species would not fall within the class *Polygamia*. It is certain that the same species of plants vary in a remarkable manner from the effects of different climates; indeed, the same individual has been observed to vary in different years, even in the same climate. “The great fertility and exuberance of the soil in some of the tropical isles, is perhaps one of the reasons,” says a learned writer,§ “Why such a number of their plants belong to the Linnæan classes of *Monœcia*, *Dicœcia*, and

* Androgynous and stameniferous, or pistilliferous flowers growing upon the same plant.

† Androgynous and stameniferous, or pistilliferous flowers growing on separate plants.

‡ Androgynous, stameniferous, and pistilliferous flowers growing separately on three distinct plants of the same species.

§ Dr. John Reinhold Forster, LL.D

Polygamia; and it is remarkable that plants, which botanists have observed to be androgynous in America, here bear their stamiferous and pistilliferous flowers on two distinct shrubs; and this may confirm the opinion, that most *Diœcous* plants are somewhere or other also found in the androgynous state; which, if it were general, would necessarily set aside that class." Upon the whole, it were better that the class *Polygamia* should be suppressed, and the plants which it embraces referred to the other classes of the system. Amongst its numerous genera the class, as it stands, contains a great number of the grasses; and in the same class with these lowly plants is placed the magnificent Maple (*Acer Saccharinum*), from the juice of which is prepared an excellent sugar, but little, if at all, inferior to the best sugars obtained from the true sugar cane (*Saccharum-officinarum*), of India.

In a medicinal point of view this class does not afford any indispensable production; although it is true that the extensive family of *Mimosa*, commonly called sensitive plants, supply us with some useful, alimentary, and medicinal articles. The Gum Arabic of the shops, is the produce of the *Mimosa Nilotica*, which grows in Arabia, in Egypt, and in Senegal; and the extract of *Catechu*, commonly called *Terra Japonica*, is the produce of the *Mimosa Cate*.

In a physiological point of view, various species of *Mimosa* are among the most interesting vegetables that are known to us, for although we see no reason to believe that sensibility, the attribute of nervous matter resides in any part of any vegetable production; yet, there belongs to these plants, in an eminent degree, a principle closely allied to what, in the animal organization, is termed irritability. To those who have, or may accustom themselves to watch the movements of the *Mimosa*, the following lines will be fully appreciated.

“ Weak with nice sense, the chaste *Mimosa* stands,
 From each rude touch withdraws her timid hands;
 Oft as light clouds o'er pass the summer-glade,
 Alarm'd she trembles at the moving shade;
 And feels alive, through all her tender form,
 The whisper'd murmurs of the gathering storm;
 Shuts her sweet eyelids to approaching night,
 And hails with freshen'd charms the rising light.”

The Loves of the Plants. Canto I. 301, &c.

For an illustration of the class *Polygamia*, see Plate 18, figures 1, 2, 3.

CLASS XXIV.

CRYPTOGAMIA.*

This class contains a vast assemblage of vegetables, in which the parts of fructification are, in many cases, either from their minuteness or from their particular situation, entirely concealed from the view, or only imperfectly visible. In a majority of the plants under consideration, it is impossible, even with the aid of a powerful microscope, to refer them to any order of any one of the preceding twenty-three classes; and although the evidence of the patient Italian botanist *Micheli*, who, in 1729, first discovered the real stamens and pistils in the Mosses—notwithstanding the confirmation of his observations by the subsequent fact of Professor Hedwig's having raised Mosses from seeds; and the now universal admission as to the existence of seeds in this tribe of plants—it yet appears that the subdivisions of the class *Cryptogamia*, as made by Linnæus, is to be unhesitatingly preferred to any other which may have taken its rise from observations that cannot

* From *κρυπτω*, to hide, and *γαμος*, association or marriage.

be verified upon an extensive scale; nor to the satisfaction of the unassisted sense.

The orders into which Linnæus subdivided this class are the five following, viz.

- | | | | |
|------|-------------------|-----------------|---------------------|
| 1st. | <i>Filices</i> , | comprehends the | <i>Ferns</i> . |
| 2d. | <i>Musci</i> , | „ „ | <i>Mosses</i> . |
| 3d. | <i>Algæ</i> , | „ „ | <i>Sea-weeds</i> . |
| 4th. | <i>Fungi</i> , | „ „ | <i>Mushroom</i> . |
| 5th. | <i>Hepaticæ</i> , | „ „ | <i>Liverworts</i> . |

Each of these possess most distinct features, habits, and qualities; and equally as distinct localities.

The ferns are very abundantly diffused over the whole earth; they are particularly plentiful in the West Indies and in North America, where they constitute a beautiful covering for the summits of many of the mountains. The roots of many of these vegetables creep and extend themselves in a horizontal direction, and not very far from the surface of the ground.

In the majority of this order (*Ferns*), the flowers are fastened to the back of the leaves; these are the true *dorsiferous ferns*. In others, however, the fructification is in the spikes; this is seen in *Ophioglossum*, *Osmunda*, and others; in which, the middle rib overtops the extremity of the leaf, or frond, and forms a stem upon which the flowers are supported; the leaves proceed either singly or in greater numbers, from

the extremities of the branches of the main root; and, in the greater number of the genera they are winged, or hand-shaped.

The *Ferns* appear to have been among the most ancient vegetable inhabitants of our earth; they are frequently found on, or impressed in stones of different kinds, particularly *Schistu*- (slate), and in nodules of iron stone in almost every part of the world; and it is a curious circumstance, that we frequently find these impressions, &c. in countries where the plants in a state of vegetation are no longer natives. The *Ferns*, found as petrified imbedments, do unquestionably furnish us with one, among many other facts, which might lead us to reflect that the globe we inhabit has undergone greater, but at the same time more gradual revolutions than the ordinary mind can conceive, or is willing to admit; and also to believe that the plants in question must have existed as members of the vegetable economy, at a period anterior to the date of those revolutions, of which the memory is preserved in the written monuments of mankind.

The Mosses, in the system of Tournefort, are termed *Aspermæ*, or plants without seeds; but we have seen that the seeds of the Mosses, and other plants belonging to the class *Cryptogamia*, have been discovered by the vigilant researches of Micheli, Hedwig, and others.

In the form and disposition of their leaves, in the manner of their growth, and in some other circumstances, the Mosses resemble the *Pines*, the *Firs*, and other *Coniferous* evergreens, which have already been mentioned. These plants frequently creep, and extend themselves like a carpet upon the ground, upon the trunks and branches of trees and shrubs, and upon various species of stones, being commonly collected into bunches or tufts. Some of the smallest plants with which we are acquainted belong to the Mosses; few of them attain to the height of a foot, whereas, among the *Ferns*, we have species that are even *arborescent*. Very few of the Mosses are annual plants; the greater number are perennial and evergreen: their growth is very slow, but they are extremely retentive of the principle of life; for after having been preserved dry for a century or more, they may be made to resume their primitive verdure, simply by moistening them with water.

The Mosses inhabit the hottest and the coldest climates; they vegetate generally with more rapidity in a cool and moist situation, with a north aspect, where they are screened from the sun; some few, however, are found in luxuriant growth on the margins of rivers with a south aspect.

The *Algæ*, sea-weed, or wrack, constitutes

the third order of vegetable development in the class *Cryptogamia*; they vary in dimensions from mere microscopic objects to a very large size, and are composed of cellular tissue in various degrees of combinations; so much so, as at times to appear to form a link between the two great kingdoms of organized matter; in many cases, and in addition to the general organs possessed by plants, (and of which these are not destitute,) we find them furnished with *Vesiculae* filled with air, by means of which they are enabled to float.

Of *Fungi*, or the fourth order; the structure of these plants is yet more simple than that of *Algæ*, consisting of little besides cellular tissue, among which sporules (more properly seeds,) lie scattered. Some, in the lowest degree of development, are composed only of a few cellules, one of which is larger than the rest, and contains the seeds; others are differently compounded, possessing innumerable cellules, and consequently a corresponding quantity of seeds.

Of the last order, *Hepaticæ*. These differ remarkably from each other in the modifications of their organs of reproduction, while they have a striking resemblance in their vegetation. The most conspicuous organ of their vegetation, (and which corresponds with the *Caudex Ascendens*, as applied to the subjects of the other classes,)

bears the name of *Fronde*, or *Thallus*; it is either a leafy branched tuft, as in Mosses, with the cellular tissue particularly large, and the leaves frequently furnished with lobes, and appendages at the base, called *Stipulae* or *Amphigastria*; or a sinuous flat mass of green vegetable matter lying upon the ground.

In *Jungermannia*, that part which is most obviously connected with the reproduction of the plant, and which bears an indisputable analogy to the *theca* of Mosses, is a valvular brown case, called the Capsule, elevated upon a white cellular tender seta, and originating from a hollow case arising among the leaves.

The *Lichens*, (which belong to this order,) have a lobed *frond* or *thallus*, the inner substance of which consists wholly of reproductive organs, which breaks through the upper surface in various forms; among which the following are the most conspicuous, viz.

1st. *Shields* (Scutella), little coloured cups with a dark disk, surrounded by a rim, and containing tubes filled with sporules or seed.

2d. *Soredia*, and which are heaps of powdery bodies scattered upon the surface of the thallus.

The nomenclature of the several parts of this order has been, as Dr. Lindley very properly

remarks, extended beyond necessity; but he as justly adds, "it is, however, absolutely indispensable that it should be fully understood by those who wish to read the systematic writers upon the subject." This, however, would far exceed the bounds of an elementary work; but it would be found of easy acquirement by reference to the fourteenth edition of the "*Systema Vegetabilium*," &c.

For illustrations of this XXIVth class, see Plate 18, figs. 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15.

CLASS IV.—*Tetrandria* contains 3 Orders, viz.

Orders.	Examples.
1. <i>Monogynia</i> , having one pistil.	<i>Dipsacus</i> , (Teasel.) <i>Plantago</i> , (Plantain.)
2. <i>Digynia</i> , „ two pistils.	<i>Aphanes</i> , (Parsley- piert.)
3. <i>Tetragynia</i> , „ four ditto.	<i>Potamogeton</i> , (Pond- weed.)

CLASS V.—*Pentandria* contains 6 Orders, viz.

1. <i>Monogynia</i> , having one pistil.	<i>Primula</i> , (Primrose.) <i>Convolvulus. Lonicera</i> , (Honeysuckle.)
2. <i>Digynia</i> , „ two pistils.	<i>Gentiana. Centaurium</i> , (Centaury.) <i>Ulmus</i> , (Elm.)
3. <i>Trigynia</i> , „ three ditto.	<i>Viburnum</i> , (Wayfaring Tree.) <i>Sambucus</i> , (Elder.)
4. <i>Tetragynia</i> , „ four ditto.	<i>Parnassia</i> , (Grass of Parnassus.)
5. <i>Pentagynia</i> , „ five ditto.	<i>Statice</i> , (Thrift.) <i>Linum</i> , (Flax.)
6. <i>Polygynia</i> , „ many ditto.	<i>Myosurus</i> , (Mouse-tail.)

CLASS VI.—*Hexandria* contains 5 Orders, viz.

1. <i>Monogynia</i> , having one pistil.	<i>Hyacinthus</i> , (Hyacinth.) <i>Narcissus</i> , (Daffodil.)
2. <i>Digynia</i> , „ two pistils.	<i>Oryza</i> , (Rice.)
3. <i>Trigynia</i> , „ three ditto.	<i>Rumex</i> , (Dock.) <i>Col- chicum</i> , (Meadow- saffron.)

238 RECAPITULATION OF THE CLASSES,

Orders.	Examples.
4. <i>Tetragynia</i> , having four pistils.	<i>Petiveria</i> , (Guinea-hen Weed.)
5. <i>Polygynia</i> , „ many ditto.	<i>Alisma</i> , (Water Plantain.)

CLASS VII.—*Heptandria contains 4 Orders, viz.*

1. <i>Monogynia</i> , having one pistil.	<i>Trientalis</i> , (Chickweed Winter Green.) <i>Aesculus</i> , (Horse-chestnut.)
2. <i>Digynia</i> , „ two pistils.	<i>Limeum</i> , (a native of Africa.)
3. <i>Trigynia</i> , „ three ditto.	<i>Saururus</i> , (Lizard's-tail.)
4. <i>Heptagynia</i> , „ seven ditto.	<i>Septas</i> , (a native of the Cape of Good Hope.)

CLASS VIII.—*Octandria contains 4 Orders, viz.*

1. <i>Monogynia</i> , having one pistil.	<i>Epilobium</i> , (Willow Herb.) <i>Erica</i> , (Heath.) <i>Daphne</i> , (Mezereon.)
2. <i>Digynia</i> , „ two pistils.	<i>Galenia</i> , <i>Weinmannia</i> , (Mountain Chickweed.)
3. <i>Trigynia</i> , „ three ditto.	<i>Polygonum</i> , (Bistort.) <i>Persicaria</i> , (Knotgrass.)
4. <i>Tetragynia</i> , „ four ditto.	<i>Paris</i> , (Herb Paris.) <i>Adoxa Moschatellina</i> , (Tuberous Moschatel.)

CLASS IX.—*Enneandria contains 3 Orders, viz.*

Orders.	Examples.
1. <i>Monogynia</i> , having one pistil.	<i>Laurus</i> , (Bay, Sassafras.)
2. <i>Trigynia</i> , .. three pistils.	<i>Rheum</i> , (Rhubarb.)
3. <i>Hexagynia</i> , .. six ditto.	<i>Butomus</i> , (Flowering Rush.)

CLASS X.—*Decandria contains 6 Orders, viz.*

1. <i>Monogynia</i> , having one pistil.	<i>Arbutus</i> , (Strawberry Tree.) <i>Ruta</i> , (Rue.) <i>Pyrola</i> , (Wintergreen.)
2. <i>Digynia</i> , .. two pistils.	<i>Saxifraga</i> , (Saxifrage.) <i>Dianthus</i> , (Pink.) <i>Saponaria</i> , (Soapwort.)
3. <i>Trigynia</i> , .. three ditto.	<i>Cucubalus</i> , (Spatling Poppy.) <i>Stellaria</i> , (Stichwort.)
4. <i>Tetragynia</i> , .. four ditto.	<i>Calligonum</i> , (a native of Mount Ararat.)
5. <i>Pentagynia</i> , .. five ditto.	<i>Sedum</i> , (Stonecrop.) <i>Oxalis</i> , (Wood-sorrel.)
6. <i>Decagynia</i> , .. ten ditto.	<i>Basella</i> , (American Nightshade.)

CLASS XI.—*Dodecandria contains 5 Orders, viz.*

1. <i>Monogynia</i> , having one pistil.	<i>Asarum</i> , (Asarabacca.) <i>Lythrum</i> , (Purple-spiked Loosestrife.)
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Orders.	Examples.
2. <i>Digynia</i> , having two pistils.	<i>Agrimonia</i> , (Agrimony.) <i>Heliocarpus</i> .
3. <i>Trigynia</i> , „ three ditto.	<i>Reseda</i> , (Dyer's-weed.) <i>Euphorbia</i> , (Spurge.)
4. <i>Tetragynia</i> , „ four ditto.	<i>Calligonum</i> , (a native of Mount Ararat.)
5. <i>Pentagynia</i> , „ five ditto.	<i>Glinus</i> , (a native of Spain.)
6. <i>Dodecagynia</i> , „ twelve ditto.	<i>Sempervivum</i> , (House- leek.)

CLASS XII.—*Icosandria contains 5 Orders, viz.*

1. <i>Monogynia</i> , having one pistil.	<i>Prunus</i> , (Black Thorn.) <i>Myrtus</i> , (Myrtle.) <i>Amygdalus</i> , (Al- mond.)
2. <i>Digynia</i> , „ two pistils.	<i>Cratægus</i> , (Hawthorn.)
3. <i>Trigynia</i> , „ three ditto.	<i>Sorbus</i> , (Mountain Ash.)
4. <i>Pentagynia</i> , „ five ditto.	<i>Mespilus</i> , (Medlar.)
5. <i>Polygynia</i> , „ many ditto.	<i>Rosa</i> , (Rose.) <i>Rubus</i> , Bramble.) <i>Fragaria</i> , (Strawberry.)

CLASS XIII.—*Polyandria contains 7 Orders, viz.*

1. <i>Monogynia</i> , having one pistil.	<i>Papaver</i> , (Poppy.) <i>Nymphæa</i> , (Water- lily.)
2. <i>Digynia</i> , „ two pistils.	<i>Pæonia</i> , (Peony.)
3. <i>Trigynia</i> , „ three ditto.	<i>Delphinium</i> , (Lark- spur.)
4. <i>Tetragynia</i> , „ four ditto.	<i>Cimicifuga</i> , (a native of Siberia.)
5. <i>Pentagynia</i> , „ five ditto.	<i>Aquilegia</i> , (Colum- bine.)

Orders.	Examples.
6. <i>Hexagynia</i> , having six pistils.	<i>Stratiotes</i> , (Fresh-water Soldier or Sailor.)
7. <i>Polygynia</i> , „ many ditto.	<i>Adonis</i> , (Pheasant's Eye.)

CLASS XIV.—*Didynamia* contains 2 Orders, viz.

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|--|---|--------------------|
| 1. <i>Gymnospermia</i> , having its seeds situated at the bottom of the Calyx. | } | <i>Glechoma</i> , |
| | | (Ground-ivy.) |
| 2. <i>Angiospermia</i> . „ its seeds contained in a Pericarp. | } | <i>Digitalis</i> , |
| | | (Fox-glove.) |

CLASS XV.—*Tetradynamia* contains 2 Orders, viz.

- | | | |
|--|---|----------------------|
| 1. <i>Siliculosa</i> , having its seeds in a small, short, or round pod. | } | <i>Lunaria</i> , |
| | | (Honesty.) |
| 2. <i>Siliquosa</i> , „ its seeds in a long slender pod | } | <i>Cheiranthus</i> , |
| | | (Wall-flower.) |

CLASS XVI.—*Monodelphia* contains 9 Orders, viz.

- | | |
|---|---|
| 1. <i>Triandria</i> , having three stamens. | <i>Aphyteia</i> , |
| 2. <i>Pentandria</i> , „ five ditto. | <i>Hermannia</i> , (a native of Africa.) |
| 3. <i>Heptandria</i> , „ seven ditto. | <i>Pelargonium</i> . |
| 4. <i>Octandria</i> , „ eight ditto. | <i>Aitonia</i> . |
| 5. <i>Enneandria</i> , „ nine ditto. | <i>Dryandra</i> . |
| 6. <i>Decandria</i> , „ ten ditto. | <i>Geranium</i> , (Crane's-bill.) |
| 7. <i>Endecandria</i> , „ eleven ditto. | <i>Brownea</i> , (a native of the West Indies.) |
| 8. <i>Dodecandria</i> , „ twelve ditto. | <i>Pentapetes</i> , (a native of India.) |
| 9. <i>Polyandria</i> , „ many ditto. | <i>Malva</i> , (Mallow.) |

Orders.	Examples.
4. <i>Association necessaria</i> , from the florets of the central inflorescence producing stamens only, and those of the radius or circumference pistils only.)	<i>Calendula</i> , (Marigold.)
5. <i>Association segregata</i> , not from any distinct character of association, but from the florets being separated from each other by means of many partial flowercups, (<i>perianths</i> ,) and these situated in a common Calyx. }	<i>Echinops</i> , (Globe Thistle.) <i>Stæbe. Odera.</i>
6. <i>Association monogama</i> , composed of simple flowers,* which have their anthers united. }	<i>Viola</i> , (Violet.) <i>Lobelia</i> , (Cardinal flower.)

CLASS XX.—*Gynandriæ*. contains 9 Orders, viz.

1. <i>Diandria</i> , having two stamens.	<i>Orchis</i> , (a native of Italy and Asia.)
2. <i>Triandria</i> , ,, three ditto.	<i>Sisyrinchium</i> , (a native of Bermuda.)
3. <i>Tetrandria</i> , ,, four ditto.	<i>Nepenthes</i> , (a native of Ceylon.)
4. <i>Pentandria</i> , ,, five ditto.	<i>Passiflora</i> , (Passion Flower.)
5. <i>Hexandria</i> , ,, six ditto.	<i>Aristolochia</i> , (a native of India and France.)
6. <i>Octandria</i> , ,, eight ditto.	<i>Scopolia</i> , (a native of Java.)
7. <i>Decandria</i> , ,, ten ditto.	<i>Kleinhovia</i> , (a native of India.)

The previous orders are all composed of compound flowers.

- | Orders. | Examples. |
|---|---------------------------------------|
| 8. <i>Dodecandria</i> , having twelvestamens. | <i>Cytinus</i> , (a native of Spain.) |
| 9. <i>Polyandria</i> , „ many ditto. | <i>Arun</i> , (Cuckow-pint.) |

CLASS XXI.—*Monœcia* contains 11 Orders, viz.

- | | |
|---|--|
| 1. <i>Monandria</i> , having one stamen. | <i>Chara</i> , (a native of England.) |
| 2. <i>Diandria</i> , „ two stamens. | <i>Anguria</i> , (a native of America.) |
| 3. <i>Triandria</i> , „ three ditto. | <i>Sparganium</i> , (Burr-Reed.) |
| 4. <i>Tetrandria</i> , „ four ditto. | <i>Morus</i> , (Mulberry.)
<i>Betula</i> , (Birch.) |
| 5. <i>Pentandria</i> , „ five stamens. | <i>Amaranthus</i> , (Amaranth.) |
| 6. <i>Hexandria</i> , „ six ditto. | <i>Zizania</i> , (a native of Jamaica.) |
| 7. <i>Heptandria</i> , „ seven ditto. | <i>Guettarda</i> , (a native of Jamaica.) |
| 8. <i>Polyandria</i> , more than seven do. | { <i>Fagus</i> , (Beech.) * <i>Sagittaria</i> , (Arrowhead.)
<i>Corylus</i> , (Hazel.)
<i>Quercus</i> , (Oak.) |
| 9. <i>Monadelpkia</i> , having the <i>filaments</i> united at the base. | { <i>Pinus</i> , (Fir.) <i>Cupressus</i> , (Cypress.)
<i>Thuja</i> , (Arborvitæ.) |
| 10. <i>Syngenesia</i> , having the <i>anthers</i> united. | { <i>Cucumis</i> , (Cucumber.)
<i>Cucurbita</i> , (Gourd.) |
| 11. <i>Gynandria</i> , having the <i>stamens</i> growing out of a body resembling a pistil. | { <i>Agyneja</i> , (a native of China.) |

CLASS XXII.—*Diœcia* contains 15 Orders, viz.

Orders.	Examples.
1. <i>Monandria</i> , having one stamen.	<i>Najas</i> , (a native of the European Continent generally.)
2. <i>Diandria</i> , „ two stamens.	<i>Salix</i> , (Willow.)
3. <i>Triandria</i> , „ three ditto.	<i>Osyris</i> , (Poet's Cassia.)
4. <i>Tetrandria</i> , „ four ditto.	<i>Viscum</i> , (Mistletoe.)
5. <i>Pentandria</i> , „ five ditto.	<i>Humulus</i> , (Hop.) <i>Caunabis</i> , (Hemp.)
6. <i>Hexandria</i> , „ six ditto.	<i>Dioscorea</i> , (a native of India.)
7. <i>Octandria</i> , „ eight ditto.	<i>Populus</i> , (Poplar.)
8. <i>Enneandria</i> , „ nine ditto.	<i>Mercurialis</i> , (Mercury)
9. <i>Decandria</i> , „ ten ditto.	<i>Carica</i> , (Papaw.)
10. <i>Dodecandria</i> , „ twelve ditto.	<i>Menispermum</i> , (Moonseed.)
11. <i>Icosandria</i> , „ twenty ditto.	<i>Flacourtia</i> .
12. <i>Polyandria</i> , „ many ditto.	<i>Cliffortia</i> , (a native of the Cape of Good Hope.)
13. <i>Monadelphæa</i> , having their <i>filaments</i> united.	} <i>Juniperus</i> , (Juniper.)
14. <i>Syngenesia</i> , having their <i>anthers</i> united.	
15. <i>Gynandria</i> , having their <i>stamens</i> growing out of a body resembling a pistil.	} <i>Clutia</i> , (a native of Africa.)

CLASS XXIII.—*Polygamia* contains 3 Orders, viz.

Orders.	Examples.				
1. <i>Monœcia</i> , having androgynous flowers, as well as flowers separately possessing stamens or pistils, but yet appearing on the <i>same</i> plant.	<table border="0" style="margin-left: 2em;"> <tr> <td style="font-size: 3em; vertical-align: middle;">}</td> <td><i>Acer</i>, (Maple.)</td> </tr> <tr> <td style="font-size: 3em; vertical-align: middle;">}</td> <td><i>Parietaria</i>, (Pel- litary of the Wall.)</td> </tr> </table>	}	<i>Acer</i> , (Maple.)	}	<i>Parietaria</i> , (Pel- litary of the Wall.)
}	<i>Acer</i> , (Maple.)				
}	<i>Parietaria</i> , (Pel- litary of the Wall.)				
2. <i>Diœcia</i> , having androgynous flowers, as well as flowers separately possessing stamens or pistils, yet each appears upon separate and distinct plants.	<table border="0" style="margin-left: 2em;"> <tr> <td style="font-size: 3em; vertical-align: middle;">}</td> <td><i>Fraxinus</i>, (Ash.)</td> </tr> <tr> <td style="font-size: 3em; vertical-align: middle;">}</td> <td><i>Gleditsia</i>, (Three- thorned Acacia.)</td> </tr> </table>	}	<i>Fraxinus</i> , (Ash.)	}	<i>Gleditsia</i> , (Three- thorned Acacia.)
}	<i>Fraxinus</i> , (Ash.)				
}	<i>Gleditsia</i> , (Three- thorned Acacia.)				
3. <i>Triœcia</i> , having androgynous flowers, as well as flowers separately possessing stamens and pistils, but so diversified and irregular in locality as to appear in some cases upon three distinct plants of the same species.	<table border="0" style="margin-left: 2em;"> <tr> <td style="font-size: 3em; vertical-align: middle;">}</td> <td><i>Ficus</i>, (Fig-tree.)</td> </tr> <tr> <td style="font-size: 3em; vertical-align: middle;">}</td> <td><i>Ceratonia</i>, (Carob Tree.)</td> </tr> </table>	}	<i>Ficus</i> , (Fig-tree.)	}	<i>Ceratonia</i> , (Carob Tree.)
}	<i>Ficus</i> , (Fig-tree.)				
}	<i>Ceratonia</i> , (Carob Tree.)				

CLASS XXIV.—*Cryptogamia* contains 5 Orders, viz.

1. <i>Filices</i> , comprehending the various <i>Ferns</i> .	
2. <i>Musci</i> , ,, ,, <i>Mosses</i> .	
3. <i>Algæ</i> , ,, ,, <i>Sea-weeds</i> .	
4. <i>Fungi</i> , ,, ,, { <i>Mushrooms, Lycoperdon,</i>	
	} (Puff Balls,) &c.
5. <i>Hepatica</i> , ,, ,, <i>Liverworts, &c.</i>	