cory[r] has runcinate leaves, and generally two ſeſſile flowers coming out together: *Endive*[s] has ſolitary, peduncled flowers, and entire leaves, only notched about the edge. Both have flowers of a fine blue; but the firſt is perennial, and the ſecond only biennial. Curled Endive, though differing ſo remarkably from its parent in the leaves, is but a variety of the laſt.

Carduus. The greater part of the ſecond ſection, in this firſt order of the nineteenth claſs, is occupied by the Thiſtles, a moſt untractable genus, not at all adapted to the delicate fingers of our lovely *Flora*. The calyx is all imbricate with thorny ſcales[t]; and how will ſhe tear this aſunder, to diſcover that the receptacle has hairs between the ſeeds; yet theſe two circumſtances form the character of the genus; and ſhe muſt obſerve that there are ſome plant, commonly called *Thiſtles*, which are not of the genus *Carduus*. For inſtance, the *Common Way-Thiſtle*[u] not having ſpines to the ſcales of the calyx, which alſo is cylindric in ſhape, whereas in the *Cardui* it bulges out at bottom, and the receptacle being

[r] Cichoreum Intybus *Lin.* Curtis, Lond. IV. 56. Ger. 284. 1. Park. 776. 2.

[s] Cichoreum Endivia *Lin.*

[t] See Pl. 25. f. 2.

[u] Serratula arvenſis *Lin.* Curt. Lond. n. 63. under the name of Carduus. Fl. dan. 644. Mor. hiſt. ſ. 7. t. 32. f. 14. Ger. 1173. 4.

naked,

naked, is not a *Carduus* in Linnæus's idea, but a *Serratula*. So likewiſe *Cotton-Thiſtle*[v] having a honey-combed receptacle, is ſeparated on account of that circumſtance. Indeed the genus would have been too vaſt and unmanageable, without an attention to theſe marks, which might ſometimes appear otherwiſe too minute. You have perhaps even heard it ſaid that the *Artichoke*[w] is nothing but a Thiſtle. It differs indeed very little; having a hairy receptacle, only the hairs being ſtiffer, it may be called briſtly; and the ſtructure of the down being the ſame, they differ principally in the calyx, for the ſcales in the Artichoke are *ſcarioſe* or ragged, fleſhy, and terminated by a channelled appendicle, emarginate and pointed—a character which you may examine at your leiſure at table. If you would ſpeculate on the blue flowers; which being ſo large, will give a good idea of florets; at the ſame time that it is alſo an excellent inſtance of the order *Polygamia-Æqualis*, and the *Capitate* or *Headed* ſection of it; you muſt prevail on your gardener to let ſome heads ſtand long after the time that they ſhould be cut for the table. [w] Cynara.

The *Burdock*, whoſe heads ſometimes faſten themſelves to your clothes as you paſs, is in the ſame diviſion with the Thiſtles: Arctium.

[v] Onopordon Acanthium *Lin.* Curt. Lond. V. 57. Mor. t. 30. f. 1. Ger. 1149. 1.

[w] Cynara Scolymus *Lin.* Blackw. 458.

the

the globoſe form of the calyx, together with the hooked tops of the ſcales which compoſe it, are the eſſential characters of the genus. The common wild ſpecies [x] has very large woolly heart-ſhaped leaves, petiolate, and unarmed.

Eupatorium. Of the third ſection, with *Diſcoid*, or, as ſome call them, *naked diſcous* flowers, few are at hand. The banks of rivers and ditches will furniſh a ſpecies of *Eupatorium* [y], a large plant with digitate leaves: uſually there are three leaflets to each leaf, which are hairy, and ſharply ſerrate, the middle one the largeſt; ſometimes the ſide leaflets are wholly wanting, and the leaf becomes ſimple: the ſtalks are lofty, rough, and quadrangular; and bear large bunches of ſmall purple flowers on their tops, with about five florets in each calyx. The characters of the genus are an oblong, imbricate calyx, a naked receptacle; a feathered down, and a very long ſtyle, divided half way the length.

Bidens. The ſame ſituations will produce you the *Bidens*; which has alſo an imbricate calyx: but the receptacle is chaffy; the corolla is ſometimes furniſhed with one floret alternately radiant; and the ſeeds are crowned

[x] Arctium Lappa *Lin.* Curtis, Lond. IV. 55. Ger. 809.

[y] Eupatorium cannabinum *Lin.* Fl. dan. 745. Mor. hiſt. ſ. 7. t. 13. f. 1. Ger. 711. 2. Common Hemp-Agrimony. See Pl. 25. f. 3.

with two erect, rugged awns, which being hooked make the ſeeds adhere to any thing that comes near them. We have two wild ſpecies, the *trifid*[z], ſo called from its trifid leaves; with erect ſeeds, and leafy calyxes: and the *nodding*[a], with lance-ſhaped, ſtem-claſping leaves, nodding flowers, and erect ſeeds. The corollas of both are yellow; but thoſe of the laſt, which is the leaſt common, are moſt ſpecious.

THE ORDER POLYGAMIA SUPERFLUA.

The ſecond order of the claſs Syngeneſia, entitled *Polygamia ſuperflua*, being ſcarcely leſs numerous than the firſt, is ſubdivided into two ſections, the firſt containing the diſcoid, and the ſecond, the radiate flowers: there is only one genus in this order with ſemi-floſculous flowers.

Of the firſt ſection, with diſcoid flowers, you have the *Tanſy*; which you find to have an imbricate, hemiſpheric calyx; the corollas of the ray, or on the outſide, trifid; the others quinquefid; the ſeeds naked, being only ſlightly edged; and the receptacle naked. Sometimes in this genus there are no imperfect flowers. Our *common* Tanacetum.

[z] Bidens tripartita *Lin.* Water Hemp-Agrimony. Curtis, Lond. IV. 57. Ger. 711. 1.

[a] Bidens cernua *Lin.* Nodding Water Hemp-Agrimony. Curtis, Lond. III. 55. Fl. dan. 841.

Tanſy [b], which not only the kitchen-garden, but dry, upland paſtures will furniſh you with, has bipinnate, or twice-feathered leaves, which are gaſhed, and ſerrate about the edges.

Artemiſia. *Southernwood*, the *Wormwoods* and *Mugwort*, all range under the genus *Artemiſia*; which has a calyx imbricate, with rounded, converging ſcales; naked ſeeds; and a receptacle either naked or with few hairs: the flowers have no ray whatever, but are ſtrictly diſcoid. *Southernwood* [c] is ſhrubby, erect, and has ſetaceous leaves, very much branched: there is a *field* or *wild Southernwood* [d], with procumbent, twiggy ſtems, and multifid, linear leaves. *Common* and *Roman Wormwoods* and *Mugwort* have erect herbaceous ſtems, and compound leaves. The *Common* [e] ſpecies has the leaves multifid, the flowers ſubglobular and pendulous, and the receptacle hairy. *Roman Wormwood* [f] has the leaves many-parted, and downy underneath, the heads of flowers roundiſh and nodding, as in the other; but the receptacle naked. *Mugwort* [g] has pin-

[b] Tanacetum vulgare *Lin.* Fl. dan. 871. Mor. hiſt. ſ. 6. t. 1. f. 1. Ger. 650. 1.

[c] Artemiſia Abrotanum *Lin.* Blackw. 555.

[d] Artemiſia campeſtris *Lin.* Ger. 1106. 5. Park. 94. 7.

[e] Artemiſia Abſinthium *Lin.* Blackw. t. 17. Ger. 1096. 1.

[f] Artemiſia pontica *Lin.* Jacq. auſtr. 1. t. 99.

[g] Artemiſia vulgaris *Lin.* Blackw. t. 431. Ger. 1103. 1.

natifid, flat, gaſhed leaves, downy underneath: the flowers are borne in ſimple, recurved racemes, and have a ray of five flowers. *Common Sea Wormwood*[h] has procumbent ſtems; many-parted downy leaves, nodding racemes, and three flowers in the ray.

Gnaphalium, comprehending many wild *Cudweeds* and the *Immortal* flowers, or *yellow* and *white Everlaſtings*, has an imbricate calyx, with the ſcales rounded, ſcarioſe, and coloured; a naked receptacle, and feathered down. There are ſeveral ſpecies both of yellow and white Everlaſtings; the moſt known of the firſt, is common in Portugal, where they adorn their churches with the flowers, which are alſo ſent annually to England: it is ſuppoſed to have been brought originally from India[i]: the leaves are linear-lanced, and ſeſſile: the flowers are borne in a compound corymb, on elongated peduncles; and the ſtem is ſubherbaceous. One of the latter[k] is very common in the gardens, and is originally of North America; this has leaves like the former, ſharp-pointed, and alternate; the ſtems herbaceous, and branched above, the flowers in corymbs, with level tops. This Gnaphalium.

[h] Artemiſia maritima. Ger. 1099. 1. Petiv. 20. 2.
[i] Gnaphalium orientale *Lin.* Comm. hort. 2. t. 55. Mor. hiſt. ſ. 7. t. 10. f. laſt.
[k] Gnaphalium margaritaceum *Lin.*

has a very creeping root; and the ſtalks and leaves are woolly: the ſilvery calyxes, as well as the golden ones, of the former, if gathered before they are too open, will continue in beauty many years.

Xeranthemum. *Xeranthemum*, or *Eternal flower*, has an imbricate calyx, with the inner ſcales membranaceous, ſhining, and forming a ſet of coloured rays to crown the flower; the receptacle is moſtly naked; and the down is either briſtly or feathered. *Annual Xeranthemum*[l] is an exception to the general character, in having a chaffy receptacle; it is alſo the only one which has a down of five briſtles: it is herbaceous, has lance-ſhaped ſpreading leaves; the outſide florets have a ſimple ſtigma, with a naked ſeed; thoſe in the middle have a ſub-bifid ſtigma. The colour of the corolla is either purple or white. There is a ſort from the Cape with yellow flowers[m].

Tuſſilago. The ſecond diviſion of this order, with *Radiate* flowers, is much the largeſt. *Tuſſilago* or *Colt's-foot* has a cylindric calyx, with equal ſcales, from fifteen to twenty in number, as long as the diſk of the flower, and a little membranous; a naked receptacle, and a ſimple or hairy down. *Common wild Colt's-foot*[n] has angular leaves, rather

[l] Xeranthemum annuum *Lin.* Mill. illuſtr. Jacq. auſtr. 4. 388.

[m] Xeranthemum ſpecioſiſſimum. Seba 2. t. 43. f. 6.

[n] Tuſſilago Farfara *Lin.* Curtis, Lond. II. 60. Ger. 811. Park. 1220.

heart-

heart-ſhaped, with ſlight indentations about the edges, underneath white; and one yellow flower on a ſcape, which is imbricate or covered with ſcales. *Butter-bur* [o] has vaſt leaves ſhaped much like thoſe of the *Colt's-foot*; many (from ten to twenty) purpliſh flowers, collected into an ovate thyrſe, on the top of a purpliſh ſcape ſet with ſcales of the ſame colour: there are ſometimes from two to ſix imperfect, white, ligulate florets, with ſcarcely any corolla, among the others. You will not be able to examine all the ſpecific characters of theſe two plants at once; for the naked ſtem which bears the flowers puſhes up alone very early in the ſpring; and the leaves do not ſucceed till the flowers are paſt.

Senecio, or *Groundſel*, is a very numerous genus [p], having a cylindric calycled calyx, with the ſcales *ſpacelate* or ſeeming mortified at top; a naked receptacle, and a ſimple down. Moſt of the ſpecies have radiate flowers, eight of them however have not, and among theſe is the *Common Groundſel* [q], ſo vulgar a weed in kitchen-gardens. *Stinking Groundſel* [r], a plant not very unlike this, has however radiate corollas, with the ſe- Senecio.

[o] Tuſſilago Petaſites *Lin.* Curtis, Lond. II. 59. Ger. 814.

[p] Fifty-nine ſpecies.

[q] Senecio vulgaris *Lin.* Curtis, Lond. I. 61. Ger. 278. 1.

[r] Senecio viſcoſus *Lin.* Dill. elth. t. 258. f. 336.

miſlorets of the ray revolute; the ſcales of the calyx are looſe; and the leaves are pinnatifid and viſcid. This grows in hedge-rows and on heaths, and is a much taller plant than the laſt.

Common Ragwort[s] has alſo radiate corollas, with the ray however not revolute but expanding: the ſtem of this is erect; the leaves pinnatifid, approaching to lyrate, with the diviſions a little jagged. This is very common by road-ſides and in paſtures. The gardens have a *purple African Groundſel*[t] from the Cape; an annual plant with a yellow diſk, and purple rays: it agrees with Ragwort in having radiate corollas with the ray expanding; the leaves are pinnatifid, equal, and very ſpreading, with a thickened recurved margin; and the ſcales of the calyx are thinly ciliated. A ſingular plant of this genus came up one year in my garden, which I took at firſt to be a new ſpecies; but, on more accurate examination, it proved to be a hybridous plant or mule, produced from this and the common Groundſel; it had the radiate flowers of the one, ſmall indeed and ſlightly tinged with purple, and the herb of the other: being annual, and producing no ſeed, this variety paſſed away with the ſeaſon.

[s] Senecio Jacobæa *Lin.* Mor. hiſt. ſ. 7. t. 18. f. 1. Ger. 280. 1. Park. 668. 1.

[t] Senecio elegans *Lin.* Comm. hort. 2. t. 30. Sebamus. 1. t. 22. f. 1.

The

The two genera of *Aſter* and *Golden-rod* furniſh abundance of flowers that enliven the autumnal ſeaſon, and continue till the ſeverity of froſt puts an end to them. They both agree in an imbricate calyx, a ſimple down, and a naked receptacle: but the inferior ſcales in the calyx of the *Aſter* are ſpreading, and have a ragged appearance; whereas in the *Golden-rod* they are cloſe: all the ſpecies alſo of the *Aſter* have more than ten ſemi-florets in the ray, but the *Golden-rods* have only about five or ſix remote ones. Some of the *Aſters* are ſhrubby, but moſt of them are tall herbaceous plants, dying down to the ground at the approach of winter, and riſing again from the ſame root the enſuing ſpring: many are confounded under the vulgar title of *Michaelmas Daiſies*. The *Amellus*, or *purple Italian Starwort*[a], is one of the loweſt ſpecies, but has large purple flowers, growing in a corymb on naked peduncles, with the ſcales of the calyx obtuſe; the leaves are lance-ſhaped, obtuſe, rugged, entire about the edges, and marked underneath with three nerves. The greater part of the perennial American Aſters have ſcaly peduncles; ſome have entire, and others have ſerrate leaves; hence a convenient ſubdiviſion of the genus: there are however ſome few ſpecies with ſerrate leaves Aſter.

[a] Aſter Amellus *Lin.* Jacq. auſtr. 435. Virg. georg. edit. Mart. p. 368.

and naked ſmooth peduncles. *Large flowering* or *Cateſby's Starwort* [v], is one of the handſomeſt; the flowers being large and of a deep purple; the calyx is ragged; the peduncles are ſcaly, and ſuſtain only one flower; the leaves are quite entire, tongue-ſhaped, and claſp the ſtem. *Chineſe Aſter* [w] is an annual plant, with ovate, angular leaves, toothed about the edge, and petiolate; the flowers terminate the branches, and have ſpreading leafy calyxes. The variety of colour, and ſize of the corolla, have made this ſpecies very generally cultivated: their being frequently double, will not induce you to miſtake a double radiate for a natural ligulate flower; which, to an unobſerving eye, it perfectly reſembles. The ſalt-marſhes on the ſea-coaſt of Europe furniſh one ſpecies, called *Sea-Starwort* [x]: this has lance-ſhaped, entire, fleſhy, ſmooth leaves; the branches are unequal; and the flowers in a corymb.

Solidago. Of the *Golden-rods* we have only one European ſpecies [y], unleſs we diſtinguiſh the *Welſh Golden-rod* [z], which ſeems but an

[v] After grandiflorus *Lin.* Mart. cent. 19. Mill. fig. 292.

[w] After chinenſis *Lin.* Dill. elth. t. 34. f. 38.

[x] After Tripolium *Lin.* Fl. dan. 615. Mor. hiſt. ſ. 7. t. 22. f. 36. Ger. 413. 1. Park. 674.

[y] Solidago Virgaurea *Lin.* Fl. dan. 663. Mor. t. 23. f. 4. Ger. 430. 2.

[z] Solidago cambrica *Hudſ.* Dill. elth. t. 306. f. 303. Petiv. herb. Brit. t. 16. f. 11.

humble

humble variety. The ſtem is a little flexuoſe or winding; and the flowers grow in erect, crowded, panicled racemes. The Welſh variety has the leaves a little hoary underneath, and roundiſh cluſtered ſpikes at the top of the ſtalk, with larger flowers appearing earlier than the common ſort: in lofty ſituations and dry ſoils, a ſtem will ſometimes produce one flower only. North America has furniſhed abundance of ſpecies, whoſe golden racemes of flowers mix happily with the purple corymbs of the Aſters; and thus they jointly enliven plantations of ſhrubs in the latter ſeaſon.

Inula, of which *Elecampane* [a] is the leading ſpecies, has the following characters—a naked receptacle; a ſimple down; and the anthers ending at the baſe in two briſtles: this ſtructure of the anthers is *unique*—the cylinder is compoſed of five ſmaller linear anthers, each ending in two briſtles, of the length of the filaments. The true *Elecampane* [a] is diſtinguiſhed by its large, ſtem-claſping, ovate, wrinkled leaves, downy underneath; and by the ovate form of the ſcales of the calyx. The ſtalks are three feet high, and divide towards the top into ſeveral ſmaller branches, each of which is terminated by one large yellow flower. The Inula.

[a] Inula Helenium *Lin.* Fl. dan. 728. Mor. hiſt. ſ. 7. t. 24. f. laſt. Ger. 793.

Flea-

Flea-banes middle [b] and *leſs* [c] are of this genus; the firſt is common in moiſt meadows, and has ſtem-claſping, oblong leaves; hollowed next the petiole; a villous ſtem terminated by yellow flowers in panicles; and the ſcales of the calyx briſtly. The ſecond [c] has alſo ſtem-claſping leaves, but waved; proſtrate ſtems; and ſubglobular flowers, eaſily known by the ſhortneſs of the ray. The place of this is by road-ſides, and where water ſtands in winter.

Doronſcum. *Doronicum*, or *Leopard's-bane*, a wild plant of the Alps, and now common among the perennials of the garden, has the ſcales of the calyx in two rows, equal, and longer than the diſk, the ſeeds of the ray naked or deſtitute of down; thoſe of the diſk crowned with a ſimple down; the receptacle naked. The common ſpecies, above alluded to [d], has heart-ſhaped leaves, ſlightly indented about the edge, and obtuſe at the end; thoſe at the root petiolate, thoſe above ſtem-claſping. The ſtalks are channelled and hairy, near three feet high: theſe put out a few ſide branches, each of which is terminated by a large yellow flower. A ſecond ſpecies [e] has ovate, acute leaves,

[b] Inula dyſenterica *Lin.* Curtis, Lond. III. 56. Ger. 482. 3.

[c] Inula pulicaria *Lin.* Curtis, Lond. III. 57. Ger. 482. 4.

[d] Doronicum pardalianches *Lin.* Mill. fig. 128. Jacq. auſtr. 4. t. 350. and Pl. 26. of this work.

[e] Doronicum plantagineum *Lin.*

ſlightly

ſlightly indented, and alternate branches. A third [f] has a naked, ſimple ſtem ending in one flower: and theſe make up the whole genus.

Tagetes has a one leafed, five-toothed, tubular calyx; five permanent florets to the ray; the ſeeds are crowned with five erect awns; and the receptacle is naked. *French* [g] and *African* [h] Marigolds, two of the gaudy annuals of the flower-garden, are of this genus. The firſt is diſtinguiſhed by a ſubdivided ſpreading ſtem; the ſecond, by an erect, ſimple ſtem, with naked, one-flowered peduncles. Of both theſe, as you well know, there are many varieties in colour, from pale brimſtone to deep orange; and the more double they become, ſo much the more does your gardener value himſelf on his ſkill or good fortune. Tagetes.

Chryſanthemum, ſo named from its golden-coloured flowers, is known by its hemiſpheric, imbricate calyx, formed of cloſe ſcales, the inner ones gradually larger, and the inmoſt membranous or chaffy; there is no down to the ſeeds, but they are only edged or margined; the receptacle is naked. Some of the ſpecies are improperly termed *Chryſanthema*, having white rays to the flowers: of theſe we have an inſtance in Chryſanthemum.

[f] Doronicum Bellidiaſtrum *Lin.* Jacq. auſtr. 4. t. 400.

[g] Tagetes patula *Lin.*

[h] Tagetes erecta *Lin.*

the

the *Ox-eye Daiſy*[i], a plant common among ſtanding graſs in meadows, and having oblong, ſtem-claſping leaves, ſawed above, and toothed below. *Corn Marigold*[k], which is a weed among the corn in ſandy lands, has yellow rays, and ſtem-claſping leaves, jagged above, and toothed below; they are ſmooth, and of a glaucous hue. Leſt you ſhould think the colour of more importance than it really is, I will put you in mind, that the ſpecies ſo commonly cultivated in flower-gardens under the name of *Chryſanthemum creticum*[l], has both yellow and white rays: theſe flowers are eſteemed in proportion as they deviate from nature; but the plant may always be known, by the pinnate, gaſhed leaves, growing broader towards the end.

Matricaria. The three genera of *Matricaria*, *Cotula*, and *Anthemis*, are nearly allied. The firſt has a hemiſpheric, imbricate calyx, with the marginal ſcales ſolid, and rather acute; the ſeeds have no down; and the receptacle is naked. The ſecond has a convex calyx; the florets of the diſk quadrifid; thoſe of the ray have only a germ with its ſtyle and ſtigmas, without any corolla: there is no down, but the ſeed is margined: and the receptacle

[i] Chryſanthemum Leucanthemum *Lin.* Curt. Lond. V. 62. Blackw. t. 42. Mor. hiſt. ſ. 6. t. 8. f. 1. Ger. 634. Park. 528. 1.

[k] Chryſanthemum ſegetum *Lin.* Curt. Lond. n. 63. Mor. t. 4. f. 1. Ger. 743. 1. Park. 1370. 1.

[l] Chryſanthemum coronarium *Lin.* Mor. t. 4. f. 2, 3.

is naked, or nearly ſo. The third has a hemiſpheric calyx, with the ſcales nearly equal; more than five ſemiflorets in the ray; no down; and a chaffy receptacle. There are plants vulgarly known by the name of *Mayweed* or *Camomile*, in each genus. *Common Fever-few*[m] alſo is a ſpecies of *Matricaria*: the leaves are compound and flat, the diviſions are ovate, and gaſhed, and the peduncles are branched: it grows upon banks, has a ſtrong, unpleaſant ſcent, the leaves are of a yellowiſh green, and the rays of the flower are white: admitted into gardens, it has generally double flowers. *Common* or *true Camomile*[n] is an *Anthemis*; and has compound pinnate leaves, the diviſions linear, acute, and a little villous. It ſometimes covers a conſiderable extent of ground on dry ſandy commons, trailing along, and putting out roots from the ſtalks; its agreeable odour betrays it as we tread upon it: that which is found in gardens, has uſually loſt all character by cultivation. Anthemis.

Achillea or *Milfoil* has an oblong-ovate imbricate calyx; from five to ten ſemiflorets in the ray; no down; and a chaffy receptacle. *Common wild Milfoil* or *Yarrow*[o] has Achillea.

[m] Matricaria Parthenium *Lin.* Fl. dan. 674. Ger. 652. 1.

[n] Anthemis nobilis *Lin.* Blackw. 298. 1. Ger. 755. 4.

[o] Achillea Millefolium *Lin.* Curt. Lond. n. 63. Fl. dan. 737. Mor. hiſt. ſ. 6. t. 11. f. 6, 14. Ger. 1072. 2. A. Ptarmica, Curt. Lond. V. 60.

bipinnate

bipinnate naked leaves, the diviſions of whic
are linear and indented; the ſtems are fu
rowed above. It is a vulgar plant in paſture
and particularly by way ſides; for it ſeem
to delight in being trod upon, and in ſu
places ſpreads itſelf abundantly. The uſu
colour of the flower is white, but it ſome
times varies to a fine purple. Other foreig
ſpecies are yellow.

The four remaining orders of this cla
being much leſs numerous than the tw
which we have already examined, there i
not the ſame occaſion for ſubdiviſions; an
accordingly Linnæus has not made any.

THE ORDER POLYGAMIA FRUSTRANEA.

The third order of *Fruſtraneous Polygam*
comprehends no more than ſeven genera
Helian-thus. from which I ſhall ſelect two—*Heliantho*
and *Centaurea.* The firſt has an imbricat
calyx, rather ſquarroſe, or having a ragge
appearance from the ſpreading of the tips
the ſcales; a two-leaved or two-awne
crown to the ſeeds; and a flat chaffy recep
tacle. Every ſpecies of this genus is a nativ
of America alone, and on the diſcovery
the new world, ſome of them were vaunte
as miracles of nature, though they are no
become ſo common as almoſt to be diſre
garde

garded. The *annual Sun-flower*[p] however it muſt be acknowledged is a flower of wonderful magnificence, and owes the diminution of regard to the facility of its propagation: the ſpecific characters are heart-ſhaped leaves, marked with three principal nerves; peduncles thickening immediately under the calyx; and the flowers nodding. No flower is more proper than this, from its great ſize, to give you an idea of a compound flower, and its component floſcules, or florets and ſemiflorets; only you will remember not to expect ſeeds from thoſe of the ray, that being the character of the order. This plant had its name from the form of the flower, not from any power it poſſeſſes of turning towards the ſun: there is uſually but one flower on a ſtalk, but I had four in my garden on a ſingle ſtem, looking to the four cardinal points. *Perennial Sun-flower*[q] is yet more common than the laſt, becauſe it ſpreads much at the root, and requires no care in the cultivation: the inferior leaves of this are heart-ſhaped and three-nerved, but the upper ones ovate. The flowers, though much ſmaller than thoſe of the laſt, are yet the largeſt and moſt ſightly of the perennial ſorts, and the ſame plant produces abundance of them. You will be on your guard againſt double flowers. The perennial ſorts ſeldom

[p] Helianthus annuus *Lin.* Mill. illuſtr.
[q] Helianthus multiflorus *Lin.* Pluk. phyt. 159. f. 2.

produce

produce ſeeds in our climate: whereas the annual, which can be propagated no otherwiſe, has them in plenty. *Jeruſalem Artichoke*[r] is alſo a ſpecies of *Helianthus*; the leaves are *ovato-cordate*, or egg-ſhaped, only hollowed at the baſe; they are alſo marked with three principal nerves; this frequently does not even flower, but it is cultivated not for the ſake of theſe, but the tuberous or knobbed roots, reſembling in form the potatoe, but in taſte an artichoke bottom. There is a ſpecies which has the common or trivial name of *giganteus* or *giant*: *Jeruſalem Artichoke* juſtly merits the ſame title, for I have meaſured ſtems of it twelve feet high.

Centaurea. *Centaurea* is a moſt numerous genus of the ſame third order, containing no leſs than ſixty-ſix ſpecies. The corollas of the ray are funnel-form, or tubular, longer than thoſe of the diſk, and irregular; the down is ſimple; and the receptacle has briſtles between the florets. This otherwiſe unwieldy genus is commodiouſly ſubdivided into ſix ſections, by the variations of the calyx, which you obſerve make no part of the generic character. I. Plants commonly called *Jaceas*, with ſmooth, unarmed calyxes. II. *Cyanuſes*, with the ſcales of the calyx ſerrate and ciliate. III. *Rhapontics*, with dry, ſcarioſe ſcales, like chaff, or as if parched. IV. *Stoebes*, with the ſpines of the calyx

[r] Helianthus tuberoſus *Lin.* Jacq. hort. 2. t. 161.

palmate.

palmate. V. *Calcitrapas*, with the ſpines of the calyx compound or ſubdivided. VI. With the ſpines ſimple or wholly undivided. To the firſt ſection belongs the *Sweet Sultan*[s], which has a roundiſh calyx with ovate ſcales; and lyrate leaves, indented about the edge. It is an annual plant, with purple flowers, of a ſweetneſs ſo powerful as to be offenſive to many perſons; they come out ſingly on long naked peduncles, and frequently vary to fleſh colour and white. There is a yellow Sweet Sultan, which differs not only in the colour of the flowers, and in having a milder odour, but alſo in having the edges of the leaves ſerrate: it is doubtful however whether it be a diſtinct ſpecies from the former. The *Great* or *Officinal Centaury*[t] is alſo of this ſection: the ſcales of the calyx are ovate; the leaves are pinnate; the diviſions ſerrate and decurrent. The plant is large and tall, and the flowers are purple.

Of the ſecond ſubdiviſion we have three plants commonly wild, and one little leſs common in gardens. *Common* or *Black Knap-weed*[u], perhaps more properly *Knob-Weed*, which the country people in ſome places call *Hard-heads*, is found in almoſt all paſtures, and is one inſtance, among many

[s] Centaurea moſchata *Lin.* Mor. hiſt. ſ. 7. t. 25. f. 5.

[t] Centaurea Centaureum *Lin.* Blackw. 93.

[u] Centaurea nigra *Lin.* Ger. 727. 1. Park. 468. 1.

others, of the vile weeds which are ſuffered to occupy graſs fields with impunity; the ſcales are ovate, with erect, capillary cilias; the leaves are lyrate and angulate; and the flowers are floſculous. *Great Knapweed*[v] has pinnatifid leaves, with the lobes lanceolate. This grows in corn fields and on balks. The flowers of both are red; but thoſe of the latter are much the largeſt and moſt ſpecious. *Blue-Bottle*[w], the third wild plant of this ſection, which every body knows for an univerſal weed among corn, and whoſe beautiful blue colour would have attracted regard, had it been rare, has linear leaves, which on the ſtem are quite entire; towards the ground they are broader, indented about the edges, and ſometimes pinnate. *Mountain Blue-bottle*[x], which has migrated from the Swiſs mountains into our gardens, is very nearly allied to this, but its flowers are much larger: the leaves alſo are lance-ſhaped and decurrent, and the ſtem is quite ſimple, whereas the wild ſort is branched. *Carduus Benedictus*, or *Bleſſed Thiſtle*[y], is an inſtance of the fourth ſection: it has doubly ſpined, woolly calyxes, furniſhed with an *involucre*; the leaves are ſemi-decurrent, in-

[v] Centaurea Scabioſa *Lin.*

[w] Centaurea Cyanus *Lin.* Mor. t. 25. f. 4. Ger. 732. 2. Park. 482. 2.

[x] Centaurea montana *Lin.* Mill. fig. 114. Curt. mag. 77. Pl. 27. f. 1.

[y] Centaurea benedicta *Lin.*

dented,

dented, and prickly: this is a ſmall annual plant with yellow flowers. We have a wild ſpecies of this ſection—the *Star-thiſtle*[z], growing by road-ſides, and in dry paſtures, but not every where: it has ſeſſile flowers, with the calyxes rather doubly ſpined: the leaves pinnatifid, linear, and toothed; the ſtem hairy, and much branched: the ſpines of the calyx are white, and the flowers red. Of the other ſections none are likely to meet your eye; indeed the roughneſs and vulgarity of their habit, in which they much reſemble Thiſtles, have occaſioned the numerous ſpecies to be little cultivated.

THE ORDER POLYGAMIA NECESSARIA.

The *Marigold* of the kitchen garden will furniſh a familiar inſtance of the fourth order—*Polygamia Neceſſaria*. The genus is known by a calyx of many equal leaves; by the ſeeds having no down, and thoſe of the diſk being membranous; and by the receptacle being naked. The *common* or *officinal*[a] ſpecies is diſtinguiſhed in having all the ſeeds boat-ſhaped, bent inwards and muricate. Calendula.

[z] Centaurea Calcitrapa *Lin.* Ger. 1166. 1.

[a] Calendula officinalis *Lin.* Mill. illuſtr. Pl. 27. f. 2.

THE ORDER POLYGAMIA SEGREGATA.

Echinops. In the *Segregate* order, beſides the calyx or perianth common to the whole flower; there is a ſecondary one, including ſeveral floſcules, or ſometimes one only; this forms one character of the genera. *Echinops* has only one flower to each partial calyx: beſides this, the floſcules are tubular, and complete; the ſeeds have an obſcure down; and the receptacle is briſtly. *Common Globe-thiſtle*[b] is ſo called from the flowers growing in globular heads: the leaves are ſinuous and pubeſcent, the jags ending in ſpines; the flowers are blue, and ſometimes white.

THE ORDER MONOGAMIA.

We have now done with the natural tribe of compound flowers, but there remains yet one order of the claſs *Syngeneſia*, in which the flowers are totally different, except in the common character of the union of the five anthers; they are ſimple, like the flowers of other claſſes, or have only one corolla incloſed within the calyx, without any common perianth. The *Violet* will furniſh you with a number of notorious examples of this order. All the ſpecies,

Viola.

[b] Echinops ſphærocephalus *Lin.* Mill. illuſtr. & Pl. 28.

5. which

which are twenty-eight, agree in a five-leaved calyx; a five-petalled irregular corolla, produced into a horn or ſpur behind; and in a three-valved, one-celled capſule, above the receptacle, or incloſed within the calyx, the *Sweet Violet* [c], that ſcents the banks, hedges, and borders of woods, in the ſpring, with its fragrant purple flowers, is one of thoſe which have no ſtalks, except the ſcape which ſupports the flower, and the runners by which they are propagated; the leaves are heart-ſhaped. The corollas are ſometimes white, and the gardens boaſt a large double variety. This is one of the few wild plants, whoſe allowed merit has ſecured it a place in every cultivated ſpot. The later ſpecies without ſcent, commonly called *Dog Violet* [d], is one of the cauleſcent, or ſtalky kind, the more adult ſtems aſcending; the leaves are heart-ſhaped, but drawn to a point at the end: the corolla is paler than that of the Sweet Violet, and having leaves proceeding from a ſtalk, cannot be miſtaken for that in which they grow immediately from the root, even if the odour were not attended to. *Heart's-eaſe* or *Panſies* [e], the univerſal favourite

[c] Viola odorata *Lin.* Curtis, Lond. I. 63. Ger. 850. 1. Pl. 29.

[d] Viola canina *Lin.* Curtis, Lond. II. 61. Ger. 851. 6.

[e] Viola tricolor *Lin.* Curtis, Lond. I. 65. Fl. dan. 623.

favourite of the more ſimple, unrefined ages, is one of thoſe which have pinnatifid ſtipules, and an urceolate or pitcher-ſhaped ſtigma; it has alſo a three-cornered, diffuſe ſtem; and oblong gaſhed leaves. Such are the characters of a plant, which every child becomes acquainted with as ſoon as he can walk into a garden: but it is not therefore wholly uſeleſs to mention it, becauſe it may at leaſt ſerve to explain ſeveral terms to you, and to aſſiſt you in the examination of plants with which you are not ſo well acquainted.

When we compare the diminutive and almoſt colourleſs Panſy, which we find wild among the corn, with the ample rich-coloured corolla, that boaſts the tiſſue of velvet, ſuch as we ſee in ſome curious gardens; we cannot but allow that human art has made a conſiderable improvement; and we ſurvey it with the more pleaſure becauſe it is not at the expenſe of the natural characters of the flower; and you may enjoy it both as a botaniſt and a floriſt.

Impatiens. That beautiful flower called *Balſam* is of this order. Linnæus names the genus *Impatiens*, becauſe the capſule when ripe is

623. Ger. 854. 1. This has numberleſs provincial names, bearing ſome alluſion to love.

" Yet markt I where the bolt of Cupid fell.
" It fell upon a little weſtern flower,
" Before milk white, now purple with Love's wound,
" And maidens call it *Love in Idleneſs*."
Midſum. Night's Dream, II. 2.

impatient

impatient of the touch, eaſily burſting, and thus throwing out its ſeeds. It has an irregular corolla of five petals like the violet, when it has not been improved into beautiful duplicity by culture; but the calyx is two-leaved; the nectary or horn is cucullate or cowl-ſhaped; and the capſule is five-valved. *True Balſam*, or, more properly, *Balſamine*[f], has the leaves lance-ſhaped, thoſe on the upper part of the plant alternate; the flowers come out three or four together, from the joints of the ſtalk, only one on each ſlender peduncle; and the nectary is ſhorter than the flower: the varieties of colour—white, red, purple and variegated, are well known. That which comes from the Eaſt-Indies has larger, finer flowers than what comes from the Weſt, moſt beautifully variegated with ſcarlet and white, or purple and white. We have a wild ſpecies called *Yellow Balſam*, and alſo by the familiar names of *Quick in hand*, or *Touch me not*[g]: one long ſlender peduncle comes out from the axils, which ſubdivides into ſeveral others, each ſuſtaining a yellow flower; the leaves are ovate; and the ſtem ſwells at the knots. This is a local plant, being obſerved only or chiefly in Weſtmoreland and Yorkſhire, in moiſt

[f] Impatiens Balſamina *Lin.* Mill. fig. pl. 59.
[g] Impatiens noli tangere *Lin.* Fl. dan. 582. Ger. 446. Park. 296. 5.

ſhady places, or by the ſides of lakes a
rivers.

You have now abundant amuſement i
your autumnal walks; and as the ſeaſo
for examination will be over before I ſha
have leiſure to prepare you freſh matter fo
future amuſement, I take leave of you ti
the enſuing ſpring; when, if health an
leiſure permit, we ſhall travel through th
few remaining claſſes.

LETTER

LETTER XXVII.

THE CLASS GYNANDRIA.

May the 1ſt, 1777.

I RENEW our purſuit as early as poſſible, my dear couſin, in order that I may be able to accompliſh my purpoſe of completing our original ſcheme during the courſe of the preſent ſeaſon.

The twentieth claſs, which falls now under our conſideration, is entitled *Gynandria*, from a circumſtance peculiar to it, which is that of having the ſtamens ſituated upon the ſtyle itſelf. You have remarked, that in every claſs hitherto examined, theſe two parts are entirely independent, ſo that we can at any time remove the one from a flower, and leave the other; but in the claſs *Gynandria* this is not permitted us; the ſtamens uſually growing out of the piſtil itſelf; but in ſome caſes upon a receptacle, produced or lengthened in form of a ſtyle, which bears both piſtil and ſtamens. This claſs has nine orders, founded on the number of ſtamens in the flowers of each; the genera are 33, and the ſpecies 275.

The firſt order, called *Diandria*, from there being two ſtamens only to the flowers in it, is perfectly natural; that is, contains a tribe

a tribe of plants agreed upon by all th world to be in ſtrict alliance; or ſuch, a when an eye properly informed has ſee one of them, it immediately refers any o the others to the ſame tribe, clan, or family as ſoon as they occur. Indeed the allianc between the greater part of theſe plants i ſo ſtrict, that ſome nomenclators have bee induced to refer them to one genus, o one family properly ſo called: for the ge nera differ hardly in any thing elſe from eac other but in the ſhape of the nectary. Som former nomenclators had eſtabliſhed the ge- nera upon the roots, which are certainly the part leaſt proper for this purpoſe, be- cauſe you cannot examine the character, without deſtroying the plant. But they were induced to it, from the ſingular form of the roots in this tribe: which in ſome ſpe- cies are a pair of ſolid bulbs; in others a ſet of oblong fleſhy bodies tapering to the ex- tremities, and ſpreading out like the fingers, whence they have the name of *palmate* or *handed.*

Having ſaid ſo much of this tribe, it is almoſt time, you think, to be acquainted with the ſingular perſonages that compoſe it. The far greater number of them then have the common appellation of *Orchis*, a name I am perſuaded you are not wholly unacquainted with.

Orchis. Take one of theſe flowers, of any ſort you can meet with; or, if no ſpecies is yet in

in blow, you will not have long to wait for ſome of them. You will find an oblong, wrinkled germ, below the flower, which has no proper calyx, but only ſpathes or ſheaths: the corolla is made up of five petals, the two innermoſt of which uſually join to form an arch or helmet over the top of the flower; the lower lip of the corolla forms the nectary, taking the place of the piſtil and a ſixth petal: the ſtyle adheres to the inner edge of the nectary, ſo that, together with its ſtigma, it is ſcarcely diſtinguiſhable: the filaments are very ſhort, and each of them is terminated by an anther, that has no covering, but has the texture of the pulp of oranges or lemons; each is lodged in a cell opening downwards, and adhering to the inner margin of the nectary; ſo that without this information you might have been at a loſs where to find the ſtamens, unleſs they happened to have burſt from their cells: the germ in time becomes a capſule, of three valves, opening at the angles under the carinated ribs; within is only one cell, and a great number of ſmall, irregular ſeeds, ſhaped like ſawduſt, are affixed to a linear receptacle on each valve. I have been more particular on the character of this tribe, becauſe the flowers have rather a ſtrange and unuſual appearance, owing to the ſingular poſition of the parts of fructification. There is a connexion between this and the liliaceous tribe;

tribe; both having but one lobe to the ſe
ſucculent roots, entire leaves, and a nak
corolla: they differ however in the num
of ſtamens, the form of the corolla a
nectary, the ſituation of the germ, t
number of cells in the capſule, the ſha
and arrangement of the ſeeds: this tr
alſo bears its flowers on a ſpadix, and
bractes interpoſed between them.

The principal genera of this tribe
thus diſtinguiſhed:

Nectary horn-ſhaped. *Orchis.*
——— bag-ſhaped. *Satyrium.*
——— ſlightly keeled. *Ophrys.*
——— ovate, gibbous underneath. *S*
rapias.
——— pedicelled. *Limodorum.*
——— inflated. *Cypripedium.*
——— turbinate or top-ſhaped. *Epide*
drum.
——— connate with the ringent coroll
Arethuſa.

The *Orchis* is the largeſt genus, the
being no leſs than fifty ſpecies, of whic
eleven are found wild in England. Th
greater number have double bulbs; in th
reſt the roots are either palmate or faſc
culate.

Of thoſe with double bulbs, woods an
buſhy paſtures produce the *Butterfly O*
chi

[h] which has the lip of the nectary lance-ſhaped [i] and quite entire: the horn very long; and the petals ſpreading out wide. The flowers of this ſmell ſweet, particularly in an evening, and very early in the morning. There are only two, or at moſt three large leaves: the ſtem is a foot, or eighteen inches high: the ſpike is long, but the flowers are thinly ſpread in it; the bractes are large, and of the length of the germ: the flowers are of a greeniſh white; the ſpur is twice as long as the germ, very ſlender, and tranſparent enough for you to diſcern the nectar through it. There is a ſmaller variety, but differing no otherwiſe than in ſize.

Pyramidal Orchis [k], found in paſtures where the ſoil is chalky, is another of thoſe which have double bulbs: the lip of the nectary is two-horned, trifid, the ſegments nearly equal, the middle one being rather the narroweſt; all of them are quite entire; the horn, or ſpur, is cylindric, ſlender, and longer than the germ; and the petals are nearly lance-ſhaped. This is an elegant ſpecies, having ſix or more radical

[h] Orchis bifolia *Lin.* Fl. dan. 235. Vaill. par. t. 30. f. 7. Mor. hiſt. ſ. 12. t. 12. f. 18. Ger. 211. 2. Park. 1351. 7.

[i] Haller ſays linear.

[k] Orchis pyramidalis *Lin.* Raii ſyn. t. 18. Jacq. auſtr. t. 266. Vaill. t. 31. f. 38. Hall. helv. t. 35. 1. Ger. 210. 4. Park. 1349. 4.

leaves;

leaves; the ſtem a foot, or eighteen inches high; the ſpike of flowers ſhort, of a broad conical form, and very thick ſet at firſt; the bractes at leaſt equal in length to the germs, lance-ſhaped, and ending in a point; the corolla bright purple.

Two of the moſt common ſorts with double bulbs, are called *Male* and *Female Orchis* fooliſhly, becauſe there is no diſtinction of ſexes; and therefore theſe names are only calculated to miſlead. The [l] firſt differs from the ſecond in having the outer petals more acute and longer; and the middle lobe of the lip bifid and longer than the ſide ones: it is alſo a much larger plant, with broader leaves, uſually ſpotted. The ſecond [m] has the lip of the nectary crenulate, or ſlightly notched on the ſides, trifid, with the middle lobe emarginate, and the petals obtuſe and linear. The height of this ſeldom exceeds ſeven or eight inches; the leaves are half an inch broad; and the ſpike is cylindric, and has few flowers; the bractes are coloured, and a little longer than the germs; the petals forming the helmet converge, and are marked with green parallel lines; the middle of the lip is ſpotted, and the ſides are rolled back; the horn is equal to the germ, with the end emarginate;

[l] Orchis Maſcula *Lin.* Curtis, Lond. II. 62. Vaill. t. 31. f. 11, 12. Ger. 208. 1. Park. 1346. 1.

[m] Orchis morio *Lin.* Curtis, Lond. III. 59. Vaill. t. 31. f. 13, 14. Ger. 208. 2. Park. 1347. 4.

th

he moſt common colour of the corolla is deep purple, but it varies to roſe-coloured, and even white. The firſt is a foot, and even eighteen inches high; the leaves an inch and half broad; the ſpike handſome, long, and thin ſet with flowers; the bractes about the ſame length with the germs, purple and lance-ſhaped; the petals that form the helmet looſe, not converging, they are purple, with lines of the ſame colour; the edges of the lip are bent downwards, the colour pale purple, with deeper ſpots at the chaps; the ſpur is ſtraight, thick, as long as the germ, or longer, dilated and compreſſed at the end. The colour of the corolla varies, even to white. This grows in meadows; and the roots make excellent *Salep*. The ſecond affects open dry paſtures. Thus you have abundant means of diſtinguiſhing theſe two ſpecies of Orchis from each other; and the roots are a ſufficient mark of diſtinction from two others, no leſs common, which we ſhall examine preſently. In the mean time, there is a ſmall but pretty ſpecies with double bulbs, which we muſt not paſs by. It grows chiefly on dry expoſed chalk hills, and is called *Dwarf Orchis*[n]: the lip of the nectary is quadrifid, and white dotted with purple; the horn is obtuſe, and

[n] Orchis uſtulata *Lin.* Fl. dan. 103. Hall. t. 28. 2. Vaill. t. 31. f. 35, 36. Mor. t. 12. f. 20. Ger. 207. Park. 1345.

the

the petals are diſtinct. The height is from four to ſeven inches: there are ſeveral leaves next the ground, but few on the ſtem: the ſpike is ſhort and cloſe ſet; the bractes are ſhorter than the germ; the helmet is pointed, and of a deep purple on the outſide: within, the petals are marked with lines and dots of purple; the horn is a little bent, and not half the length of the germ.

Two very common ſpecies with palmate, or handed bulbs, are the *broad-leaved*[o] and *ſpotted Orchis*[p], generally found in moiſt meadows. The firſt has the roots rather palmate and ſtraight; the horn of the nectary conic, the lip three-lobed, and turning back on the ſides; the bractes large, and longer than the flowers, ſo as to give the ſpike a leafy appearance. The horn is ſhorter than the germ, bent and obtuſe. The colour of the corolla is purple, varying to roſe and white. The ſecond has narrower leaves, and a ſolid ſtem, whereas that of the firſt is hollow; it is alſo higher, and flowers later; the leaves of both are ſpotted with black, but this more generally; the bractes are ſmaller and narrower; the corolla of a paler purple; the lip of the nectary is deeper cut, the ſide lobes are

[o] Orchis latifolia *Lin.* Curt. Lond. V. 65. Mill. illuſtr. Fl. dan. 266. Hall. 32. 2. Vaill. t. 31. f. 1.—5. Ger. 220. f. 1, & 222. f. 3.

[p] Orchis maculata *Lin.* Hall. t. 32. 1. Vaill. t. 31. f. 9, 10. Ger. 220. 2. Park. 1357. 3.

notched,

notched, the middle one very narrow, quite entire, and drawing more to a point.

I ſhall mention only one ſpecies more of *Orchis*, and that alſo has palmate roots: it is found in paſtures, but by no means ſo common as the two laſt: you may call it *long-ſpurred*, or *ſweet Orchis*[q], and you will know it by the great length and ſlimneſs of the ſpurs: the lip is trifid, equal, ſlightly notched, and obtuſe; and the ſide petals ſpread out very wide. The ſtem is leafy, and grows to the height of eighteen inches; the bractes are ſharp pointed, and of the length of the germ; the corolla is purple, and all of one uniform colour; the ſmell is ſtrong, but, in ſome circumſtances, ſweet.

The ſecond genus of this natural tribe is the *Satyrium*, which, inſtead of the horn, or ſpur, has a ſhort, bag-form, or double-inflated nectary, at the back of the flower. This is a much leſs numerous genus than the laſt, having only eight known ſpecies. Of theſe I ſhall ſelect two; *Lizard Satyrion*[r], and *Frog Satyrion*, commonly called *Frog Orchis*[s]. The firſt is found in chalky paſtures, but rarely; and has been rendered Satyrium.

[q] Orchis conopſea *Lin.* Fl. dan. 224. Hall. t. 29. 2. Vaill. t. 30. f. 8. Ger. 222. 2.

[r] Satyrium hircinum *Lin.* Hall. t. 25. Mor. t. 12. f. 9. Ger. 210. 1. Park. 1348. 1.

[s] Satyrium viride *Lin.* Fl. dan. 77. Hall. t. 26. 2. Ger. 224. 9. Park. 1358. 9.

more rare by the diligence with which it has been ſought after, to tranſplant it into gardens, where it ſeldom continues long, this tribe being generally abhorrent of culture. It has double undivided bulbs; lance-ſhaped leaves; the lip of the nectary trifid, the middle lobe linear, oblique, extremely long, flaunting like a ribband, and ſeeming, as it were, bitten off at the end. It is a very large lofty plant, from eighteen inches to three feet in height; the leaves alſo are half a foot long and more, and three inches broad; the ſpike has many flowers, and, by age, grows very long and becomes bent; the bractes are ſlender, acute, greeniſh, and twice as long as the germs; the colour of the corolla is greeniſh without, and ruſty within, with purple lines and ſpots: the flower has a ſtrong goatiſh ſmell.

Frog Orchis is much more common in meadows. The bulbs of this are palmate, the leaves oblong and obtuſe; the lip of the nectary trifid, with the middle lobe obſolete, or ſo ſmall as to be obſcure. This is a much lower and ſmaller plant than the former, not being above ſeven or eight inches high: the radical leaves are broad and ovate; thoſe on the ſtem, which are few, lance-ſhaped: the ſpike is rather thin ſet with flowers: the bractes are lance-ſhaped, and longer than the germ: the helmet is almoſt cloſed, pale green, with a purple line dividing the petals; the lip is yellow,

yellow, hangs down ſtraight, and grows broader towards the end; the whole corolla becomes duſky red with age.

The third genus of the *Orchis* tribe is entitled *Ophrys*: it has no horn or bag at the back of the corolla, but one petal longer than the reſt, hanging down, and marked underneath with a longitudinal riſing, called the keel. This it is which in ſome ſpecies takes the form of an inſect ſo exactly, as to appear real at a certain diſtance. Ophrys.

One ſpecies, called *Common Twayblade* [t], or *Twyblade*, from its having always two leaves, and no more, is frequent in woods and buſhy paſtures. It has fibrous roots, two ovate leaves, and the lip of the nectary bifid. The ſtem is eighteen inches high, rather rough or hairy, and naked, except the two large leaves in the middle, between the root and the ſpike, which is ſometimes ſix inches long, and has forty flowers, thin ſet on ſhort peduncles; the bractes are very ſmall, broad, and ſharp-pointed; the germ is round, and thicker than in any other of the ſpecies; the corolla is of a greeniſh yellow.

The latter end of ſummer and beginning of autumn flowers the *Spiral Ophrys*, commonly called *Triple Ladies Traces* [u]; you

[t] Ophrys ovata *Lin.* Curtis, Lond. III. 60. Ger. 403. 1.

[u] Ophrys ſpiralis *Lin.* Curtis, Lond. IV. 59. Fl. dan. 387. Park. 1354. 3.

will find it on heaths and dry paſtures. The root conſiſts of oblong aggregate bulbs; the ſtem is a little leafy, the flowers are ſpiral, and all on one ſide of the ſtem; and the lip of the nectary is undivided and ſlightly notched. This is a ſmall plant, ſeldom above five or ſix inches high, though in a leſs dry ſoil it will riſe to a foot; it has four or five leaves next the ground; the ſpike is long and ſlender, having twenty flowers, white within and yellowiſh without; the bractes are not flat, but hollow, and longer than the germ; the three outer petals of the corollas are glued together; the lip is roundiſh and ciliate. It has a pleaſant odour.

But the moſt intereſting and admired ſpecies of this genus are the *Fly* and *Bee Orchiſes*, which agree in having two roundiſh bulbs, and a leafy ſcape or ſtem. Linnæus thinks the Fly and the two Bees [v] not to be ſpecifically different, but in this I cannot agree with him. *Fly Ophrys* or *Orchis* [w] has the lip of the nectary quadrifid; in the *common Bee Orchis* [x] it conſiſts of five lobes, which are deflex or bent downwards; and in the *green-winged Bee*

[v] Ophrys inſectifera *Lin.*

[w] Orchis muſciflora *Halleri.* 1265. t. 24. 2. Ophrys inſectifera myodes *Lin.* Oph. muſcifera *Hudſ.* Vaill. t. 31. f. 17, 18. Ger. 213. 6. Park. 1352. 10.

[x] Orchis fuciflora *Hall.* Ophrys apifera *Hudſ.* Curtis, Lond. I. 66. Ger. 212. 4. Park. 1351. 5.

Orchis

Orchis, now called *Spider Ophrys*[y], it is roundiſh, entire, emarginate, and convex. But beſides this character from the lip of the nectary, the *Fly* is a ſtiffer, ſtraighter plant than the *Bee*, not ſo leafy, and having the flowers thinner ſet; in other reſpects they are much alike, except in the corollas, which are widely different: that of the fly has the three outer petals ovate, entire, ſmooth, herbaceous, and ſpreading; the two inner linear and dark purple; the lip of the nectary oblong, dark purple above, and herbaceous underneath, with a blue ſpot or band below the upper lobes. *Bee Orchis* has the three outer petals ſpreading, oblong, and purple, marked with three green nerves; the two inner lateral ones linear, villous, and green; the lip of the nectary large, roundiſh, purple, and like velvet, the lobes deflex, with a double variegated yellow, ſmooth, ſhining ſpot at the baſe. *Spider Orchis* is a lower plant; the lip of the nectary is of a leſs cheerful colour, without any of the yellow that decorates the *Bee*, and both helmet and wings are green: the three outer petals are oblong and ſpreading, the inner linear and ſhorter; the lip of the nectary is large, roundiſh, entire, emarginate, convex, and appearing like velvet, duſky purple above,

[y] Ophrys inſectifera arachnites *Lin.* Oph. aranifera *Hudſ.* Vaill. t. 31. f. 15, 16. Ger. 212. 3.

with a green edge, and a double ſpot at the baſe; beneath it is herbaceous. Theſe three beautiful plants are found among graſs in a chalky ſoil, and form a ſucceſſion from April to Auguſt: the *Spider* comes firſt in April and May, the *Fly* next in June, and laſt of all the *Bee* in July and Auguſt.

I have been the more particular on this ſingular tribe of plants, becauſe, ſpurning culture, they are not liable to eſſential changes, or indeed to any that I know of, except in colour: you muſt alſo ſearch for them abroad, and conſequently unite exerciſe with ſtudy, which is one of the principal advantages of Botany; for I cannot allow you to gather plants by proxy, ſince you would thus loſe half the pleaſure of the purſuit, as well as the benefit: and why ſhould you not have as much enjoyment in ſearching for a beautiful plant, or finding an elegant flower, as the men have in looking for a hare, or ſhooting a partridge. I will only add, that ſhould you be ſo happy as to meet with the *Lady's Slipper*[2], you would be highly delighted with its ſingular, large, hollow, inflated nectary, the form of which has given occaſion to the name. Haller however obſerves, that it has more reſemblance to a wooden ſhoe in form,

Cypripedium.

[2] Cypripedium Calceolus *Lin.* Mill. fig. 242. Ger. 443. *Sowerby*'s Engliſh Botany, t. 1.

and therefore is unworthy the title of *Venus's Slipper*, which Linnæus has beſtowed upon it. Without entering into this important diſpute, I will obſerve to you, that the root is fibrous; the ſtem about a foot high, and leafy; the two firſt leaves ſmall, and keeping almoſt cloſe to the ſtalk; the reſt (from four to ſeven) ovate-lanced: one, or at moſt two flowers come out on the ſame ſtem, of which there are ſometimes ſeveral from the ſame root: the bracte is very large, as is alſo the germ: there are but four petals to the flower, ſpreading out almoſt at right angles to each other, and often convolute; their colour is purple; of the two outer petals, one ſtands up above the nectary, the other hangs down behind it; the two inner petals ſtand out ſideways, and are narrower: the ſlipper or lip of the nectary is yellow, ſpotted within, and marked longitudinally with ridges and furrows.

THE ORDER PENTANDRIA.

In the order *Pentandria* you will find the numerous and beautiful genus of *Paſſion-flower*. The flowers have three piſtils, a five-leaved calyx, five petals to the corolla, a radiate crown for a nectary; and the fruit is a berry on a pedicle. None of the ſpecies are European, but moſtly natives either of New Spain, the Braſils, or Paſſiflora

the Weſt Indian Iſles; ſo that they require the protection of the conſervatory at leaſt, if not of the ſtove, except one or two, which will ſtand abroad in a ſheltered ſituation, with a little attention, in ſevere weather. I ſhall ſelect the ſpecies which you are moſt likely to meet with, rather than the rareſt. *Blue Paſſion-flower* [a], though a native of the Braſils, is ſeldom injured with us, except in very ſevere winters. Againſt a houſe it may be trained up to the height of forty feet, and throws out annually ſlender ſhoots, fifteen or ſixteen feet long: the leaves are palmate or handed, compoſed of five ſmooth, entire, obtuſe lobes, the middle one longeſt, the outer ſhorteſt, and often divided: they are petiolate; the petioles have two glands, and at their baſe is a ſtipule in form of a creſcent, and a long claſper, by which the ſlender ſhoots ſupport themſelves: the flower comes out at the ſame joint with the leaf, on a peduncle near three inches long; round the centre of it are two radiating crowns, the inner inclining towards the central column, the outer, which is longer, ſpreading flat upon the petals, and compoſed of innumerable threads, purple at bottom, but blue on the outſide. On the top of the central column ſits an oval germ, from whoſe baſe five awl-

[a] Paſſiflora cærulea *Lin.* Mill. illuſtr. Curt. magaz. 28. and Plate 30. of this work.

ſhaped

ſhaped ſtamens ſpread out horizontally, and theſe are terminated by oblong, broad, pendant anthers, which are eaſily moveable; from the ſide of the germ ariſe three ſlender, purpliſh ſtyles, diverging, and ending in obtuſe ſtigmas: the flower continues but one day, but there is a conſtant ſucceſſion from July till autumnal froſts ſtop them. The germ ſwells to a large, oval fruit, of the ſize, ſhape, and colour of the Mogul Plum, incloſing a ſweetiſh, but diſagreeable pulp, in which the oblong ſeeds are lodged.

Incarnate or *trilobate Paſſion-flower* [b] is a native of North America, and though the firſt ſpecies known among us, is not ſo common as the *Blue*. It differs from the former in having only three lobes to the leaves, which are ſerrate or toothed like a ſaw; the ſide lobes are ſometimes divided into two narrow ſegments: the petals of the corolla are white, with a double, purple fringe, ſtar, or glory: the fruit is as large as a middling apple, and when ripe is of a pale orange colour.

There is a ſort, called *Granadilla* [c] in the Weſt Indies, where the fruit is eaten. It has undivided, oblong leaves, hollowed next the petiole, which has two glands; the involucres are quite entire, as are alſo the

[b] Paſſiflora incarnata *Lin.* Mor. hiſt. ſ. 1. t. 1. f. 9.
[c] Paſſiflora maliformis *Lin.* Plum. amer. t. 82.

leaves

leaves about the edge. The corolla is large, with white petals, and a blue glory. The fruit is roundiſh, the ſize of a large apple, and yellow when ripe.

Another ſort, called *Water Lemon*[d] in the Weſt-Indies, has an agreeable acid flavour in the pulp of the fruit, which quenches thirſt, and is given there in fevers. It has undivided ovate leaves, quite entire about the edge; two-glanded petioles; and toothed involucres: the corolla is white with browniſh red ſpots, and the glory or crown is violet: the fruit is of the ſize and ſhape of a pullet's egg, and when ripe is yellow. But ſince the rarer ſpecies may not readily fall under your cognizance, I reſtrain my deſire of enlarging on ſo remarkable and beautiful a genus; and paſs on to a vulgar plant, which you will find in the laſt order, *Polyandria*, and with that I will cloſe our examination of this claſs, and my prate for the preſent.

THE ORDER POLYANDRIA.

Arum. This is the common *Arum*, *Wake-Robin*,

[d] Paſſiflora laurifolia *Lin.* Jacq. hort. 2. t. 162. amer. pict. t. 219.—P. alata is figured in Curtis's Magaz. 66. and P. lunata, is moſt elegantly figured by Mr. Sowerby, in a ſuperb and ſplendid work, begun by J. E. Smith, M. D. under the title of *Icones pictæ Plantarum rariorum.*

or

or *Cuckow-pint*[c], called alſov ulgarly *Lords and Ladies*. Early in the ſpring it puſhes up a one-leafed cowl-ſhaped ſpathe, under hedges and among buſhes; if you open this ſpathe, you diſcover a ſpadix, naked on the upper part, covered with germs at the bottom, and with anthers in the middle. This is diſtinguiſhed from the other ſpecies, which are many, by having no ſtem but that which bears the fructification, haſtate leaves that are quite entire, and the ſpadix club-ſhaped. Though it has the trivial name from the black ſpots upon the leaves, yet that is not a conſtant character, for oftentimes they are quite plain. As the plant advances, the ſpathe opens, and diſcovers the club, varying from yellowiſh green to fine purple or red; theſe gradually decay, and leave a head of round red berries, which, as well as the reſt of the plant, are very hot and biting. To this, with ſome others nearly allied to it, you would perhaps find it difficult to aſſign the proper claſs, unleſs, from the ſtrange and unuſual appearance of the fructification, you were led to ſearch for it in that now under conſideration. Theſe have not properly the ſtamens growing upon the ſtyle, but both are borne upon a receptacle lengthened out in manner of a ſtyle, and performing the

[c] Arum maculatum *Lin.* Curtis, Lond. II. 63. Mill. illuſtr. Mill. ic. t. 52. f. 1. Blackw. 228. Fl. dan. 505. Ger. 834. 1.

ſame

ſame office as the piſtil in the other genera. Linnæus obſerves that he might, and perhaps ought to have ranged ſuch plants under other claſſes; but he was deterred by the difficulty of aſſigning the number of ſtamens to each piſtil. Since he found a difficulty in removing them, you and I, dear couſin, will leave them quietly in the place which he has aſſigned them.

LETTER XXVIII.

THE CLASS MONOECIA.

May the 15th, 1777.

WE have hitherto, dear couſin, been converſant with ſuch plants as bear perfect or complete flowers only, except in the claſs *Syngeneſia*, wherein we found imperfect, and even neuter, floſcules among the perfect ones. But in the twenty-firſt and twenty-ſecond claſſes, which we are now to examine, you will never find any complete or perfect flowers; on the contrary, if they have ſtamens, there are no piſtils, and if they have piſtils, they are deficient in ſtamens. This is the common character of theſe two claſſes, and the only difference between them is, that in the claſs *Monœcia*, the ſtaminiferous and piſtilliferous flowers are found on the ſame individual plant; whereas in the claſs *Diœcia* they are always on diſtinct plants of the ſame ſpecies. It is ſcarcely neceſſary to add, that in both, the flowers which produce ſtamens fall off without being followed by fruit or ſeed: and that the others, which have the germ, are fruitful.

The claſs *Monœcia*, which is the twenty-firſt in the ſyſtem, has eleven orders, taking

ing their titles and characters from the foregoing claſſes; eighty genera, and three hundred and ſeventy ſpecies.

The third order, *Triandria*, contains ſeveral genera nearly allied to the Graſſes in habit, leaves, and placentation, or having only a ſingle lobe to the ſeed: they differ however in the culm or ſtraw not being hollow, but filled with a ſpungy ſubſtance; and in having no corolla.

Typha. Since Haller thinks there is a natural connexion between the *Arum*, with which I finiſhed my laſt letter, and the *Typha* or *Cat's-tail*, let us begin our examination with this. Having three ſtamens, it belongs of courſe to the order *Triandria*, and having the air of the Graſſes, it ranges in the natural tribe of the *Calamariæ*, juſt mentioned. The flowers on both ſides are borne on a cylindric *Ament*; the ſtamineous flowers ſurrounding the end of the ſtem; and thoſe which have the piſtils growing in the ſame manner below them, and very cloſe ſet: there is no corolla to either: the firſt have an obſcure, three-leaved calyx; in the ſecond it conſiſts of pappous or villous hairs, and theſe have one ſeed, ſitting on a capillary down or briſtle: ſuch are the generic characters. The *greater*, or *broad-leaved Cat's-tail*, otherwiſe called *Reed-mace*[f], is

[f] Typha latifolia *Lin.* Curtis, Lond. III. 61. Mor. hiſt. ſ. 8. t. 13. f. 1. Ger. 46. Park. 1204. 1.

known

known by its ſword-ſhaped leaves, and by having the two aments approximating. It is a large plant, being about ſix feet in height, with leaves three feet long and more, but not an inch wide; it is common in the water, on the banks of rivers, but eſpecially in moats, ponds, and marſhes. There is a ſmaller ſpecies [g], not ſo common, which has ſemicylindric leaves, and the two aments remote from each other; the ſtem of this is not above three feet high, and the leaves are much narrower, ſtiffer, and embrace the ſtem more.

Sparganium, or *Bur-reed*, approaches very near to *Typha:* but the flowers of each ſort are collected into a head, or roundiſh ament, thoſe which have ſtamens above, and thoſe which have piſtils below, on the ſame ſtem: neither have any corolla; both have a three-leaved calyx; the piſtilliferous flowers have a bifid ſtigma, and are followed by a ſingle juiceleſs drupe, containing one ſeed. *Erect* or *greater Bur-reed* [h] is common in the ſame ſituations with *Typha*, and few plants exhibit more plainly the character of the claſs *Monœcia.* The ſtem is erect, and about three feet high; the leaves are erect and Sparganium.

[g] Typha anguſtifolia *Lin.* Curtis, Lond. III. 62. Mor. hiſt. ſ. 8. t. 13. f. 2. Park. 1204. 2.

[h] Sparganium erectum *Lin.*—ramoſum *Hudſ.* Mor. t. 13. f. 1. Ger. 45. f. 1. Curtis, Lond. V. 66.—in V. 67. he figures Sp. ſimplex, as diſtinct from the ramoſum. Ger. 45. 2. Mor. f. 2.

three-