a little membrane on each ſide uniting to form a cowled tube. Though there are many ſpecies of this genus, yet perhaps none of them may offer themſelves to your view. We will proceed therefore to a favourite genus, that ranges in the ſecond order, or that which has ten ſtamens: I mean *Geranium*, which, out of its eighty-two ſpecies, will furniſh you ample matter for examination, eſpecially as I know you cultivate ſo many of them. Before you determine the circumſtances in which they differ, let us ſee in what they all agree: this is in having one ſtyle terminated by five ſtigmas; and a fruit compoſed of five grains, and beaked; whence its names of *Geranium* and *Craneſhill*. We may add that the calyx is ſingle and five-leaved, as well as the corolla; that the filaments are alternately longer and ſhorter, but all ſhorter than the corolla; and very ſlightly connected in thoſe which have a regular corolla; that the ſtyle is longer than the ſtamens, and permanent; and that each of the five ſeeds is terminated by a tail or awn, aſſiſting to form the beak, and which when the ſeed is ripe becomes ſpiral, and thus detaches the ſeed from the plant.

Geranium.

The African ſpecies, of which we have ſo many from the Cape of Good Hope, have the five parts of the calyx united at bottom; the petals unequal; and ſeven only of the filaments furniſhed with anthers; the

the flowers grow many together in a kind of umbel; the ſeeds are naked, with a feathered awn, and the leaves grow alternate upon the ſtalk, which is ſhrubby.

In this firſt ſection you find, among many others, the *Fulgid*[m], with a fleſhy ſtem, putting out but few branches; the leaves three-parted and gaſhed, the middle ſegment much larger than the others; frequently falling off, ſo as to give the ſtalks an appearance of being dead during the ſummer; the flowers are produced on ſhort footſtalks, in a ſort of double umbel, each ſuſtaining but two or three flowers, remarkable for their deep ſhining ſcarlet colour.

The well known *Scarlet*[n], which would be at leaſt as much eſteemed as the Fulgid, were it not more common. The leaves are almoſt orbicular, except that they are hollowed next the petiole; they are notched about the edge, but not gaſhed or lobed; their ſurface is downy; and they ſtain the fingers if handled roughly, whence the trivial name of *inquinans* or ſtaining. This is a much loftier plant than the laſt, growing as high as eight or ten feet; and ſends out abundance of erect branches: the flowers in the umbels are numerous, and are produced on very long peduncles.

[m] Geranium fulgidum *Lin.* Dill. elth. t. 130. f. 137.

[n] Geranium inquinans *Lin.* Mill. illuſtr. Dill. elth. t. 125. f. 151, 151. Mart. cent. 3.

The

The *Papilionaceous* [o], ſo called, beca
the corollas have ſomething the appeara
of butterfly or pea-bloſſom flowers,
two upper petals, which are large, turn
up like the banner or ſtandard in thoſe flo
ers; theſe are finely variegated, but
three under petals being reflex and ſmall
ſcarcely obſerved, but on a near inſpecti
the flowers are many in each umbel:
leaves are large, angular, rough, and ſta
on long petioles.

The *Hollow-leaved* [p] has roundiſh lea
contracted on the ſides ſo as to ſtand h
low; the edges are ſharply indented;
flowers are large, and produced in la
looſe umbels; the corollas are purple: i
a plant of large ſtature, and very hairy.

There is another ſort, or variety, v
like this; but it has leaves of a thicker ſu
ſtance, and divided into ſeveral acute
gles: the branches are not ſo irregular, a
the bunches of flowers are not ſo large.

The *Horſe-ſhoe* [q] is perhaps the ſpec
moſt commonly known of all the Africa
the dark or purpliſh mark, in ſhape o
horſe-ſhoe upon the leaves, ſhows this G
ranium to the eye at firſt ſight; but it

[o] Geranium papilionaceum *Lin.* Dill. elth. t. 128
155. Mart. cent. 15.

[p] Geranium cucullatum *Lin.*—cowled. Dill. elth
129. f. 156. Mart. cent. 28.

[q] Geranium zonale *Lin.* Comm. præl. 51. t. 1
See the flower in pl. 22. f. 3.

not abſolutely permanent; for we have varieties without it; we muſt have recourſe therefore to the form of the leaves, as a more certain diſtinction: they are orbicular, hollowed next the petiole, divided on the circumference into ſeveral obtuſe ſegments, each of which is ſlightly indented. This ſort is very branching: the flowers are produced in large, cloſe umbels, on long peduncles, and vary from a light purple to a high ſcarlet.

The *Vine-leaved*[r] has ovate, aſcending pubeſcent leaves, having the ſmell of Baum, when rubbed; the flowers grow in a cloſe head, on long peduncles, riſing much higher than the branches; they are ſmall, and pale blue.

The *Roſe-ſcented*[s] has alſo lobed leaves, waved and villous; like the laſt, the flowers grow in cloſe heads; they are of a purpliſh blue: the branches are very irregular and weak: and the whole is weaker and grows taller than the former: the leaves when rubbed ſmell like dried roſes.

The plants of the ſecond ſection have many things in common with thoſe of the firſt; but differ in being herbaceous, and having the leaves oppoſite. Of theſe the *Odorous*[t] is remarkable for its powerful ſcent,

[r] Geranium vitifolium *Lin.* Dill. elth. t. 126. f. 153.
[s] Geranium capitatum *Lin.* Riv. pent. 326.
[t] Geranium odoratiſſimum *Lin.* Dill. elth. t. 131. f. 138.

ſomething

ſomething like Aniſeed: this has a very ſhort fleſhy ſtem, with long branches, and heart-ſhaped leaves extremely ſhort: the flowers are produced from the ſide of long proſtrate ſtalks, upon ſlender peduncles, three, four, or five together; they are white, and very ſmall.

The *Night-ſcented*[u] has ſeſſile calyxes, and bifid one-leafed ſcapes: the leaves are hairy, and almoſt as finely divided as the carrot; the ſtalks are about a foot high, and have two or three ſmaller leaves that are ſeſſile; hence ariſe two or three naked peduncles, terminated by an umbel of yellowiſh flowers, marked with dark purple ſpots, ſmelling very ſweet after ſun-ſet. Linnæus has taken his trivial name from the dulneſs of the colour in the flower.

The third ſection contains ſuch Geraniums as have only five of the ſtamens anther-bearing; five-leaved calyxes, and fruits hanging down. The corollas of theſe are leſs irregular; and the ſeeds are naked, terminated by a hairy awn.

Of this ſection we have ſome European ſpecies, as *Hemlock Craneſbill*[v], common in ſandy ſoils: this has a branching ſtalk, pinnate leaves, with the ſegments gaſhed and obtuſe, and many flowers on a peduncle.

[u] Geranium triſte *Lin.* Com. can. t. 110. Breyn. cent. t. 58.

[v] Geranium cicutarium *Lin.* Curtis, Lond. I. 51. Ger. 945. 3.

Very

Very like this is *Muſk Craneſbill*[w], but it is a larger plant, much leſs common, and eaſily known by its muſky odour: the diviſions of the leaves are pinnatifid. Some ſpecies[x] of this ſection are remarkable for the largeneſs of their beaks, and furniſh a good idea of the name of the genus.

In the three remaining ſections, all the ten filaments are topped with anthers; the calyxes are five-leaved; the corollas regular; the ſeeds covered with an *aril*, and terminated by a ſmooth awn. In the fourth ſection, the flowers are conjugate; that is, there are two always on every peduncle: the plants are perennial.

Some of the largeſt and handſomeſt of the European ſorts range in this ſection; as *Spotted Craneſbill*[y], with the peduncles and leaves alternate, the calyxes a little awned, the petals waved, and the ſtem erect. The leaves are divided into five or ſix lobes, laciniate on their edges; thoſe near the root ſit on long petioles, but on the upper part of the ſtalk they are ſeſſile. The flowers are of a dark purple. There is a variety of this with light purple corollas.

Meadow Craneſbill[z] has the leaves divided

[w] Geranium moſchatum *Lin.* Riv. pent. 110. Ger. 941.

[x] Geranium arduinum, gruinum, ciconium *Lin.*

[y] Geranium phæum *Lin.* Ger. 942. 3. Park. 704. 3.

[z] Geranium pratenſe. Curtis, Lond. IV. 49. Ger. 942. 1.

into ſix or ſeven lobes, cut into ſeveral acute ſegments; they are wrinkled, and rather peltate; the petals are entire, and of a fine blue.

The Geraniums of the fifth ſection differ from thoſe of the fourth only in being annual. Moſt of the common European ſorts are of this diviſion: as *Herb Robert*[a], known by its hairy, pointed, ten-angled calyxes. The leaves are doubly pinnate, with the end-lobes confluent; they are generally hairy, the ſtalks red, and the whole plant has a ſtrong hircine ſmell. *Shining Cranesbill*[b] has the calyxes pyramidal, angled, elevated and wrinkled; the leaves rounded and five-lobed; the whole plant is ſmooth and ſhining; the ſtalks are red.

The *common Dove's-foot* or *ſoft Cranesbill*[c] has the peduncles and floral leaves alternate; the petals bifid or rather obcordate; the calyxes awnleſs, but ending in a ſhort point; and the ſtem rather erect. The ſtipules are alſo bifid: the leaves are very ſoft, kidney-ſhaped, divided half-way into five or ſeven parts, and each of theſe lobes trifid and blunt. This is very common, eſpecially in ſandy ſoils. Another[d]

[a] Geranium Robertianum *Lin.* Curtis, Lond. I. 52. Ger. 939. & 945. 5.

[b] Geranium lucidum *Lin.* Fl. dan. 218. Mor. t. 15. f. 6. Park. 707. 9.

[c] Geranium molle *Lin.* Curtis, Lond. II. 50. Fl. dan. 679.

[d] Geranium rotundifolium *Lin.* Blackw. 58. Vaill. par. t. 15. f. 1. Ger. 938. Park. 706. 2.

ver

very like it in many reſpects, but more partially diſtributed, has entire petals, ſcarcely longer than the calyx; and the ſtem more proſtrate. *Long-ſtalked Craneſbill*[e] has peduncles longer than the leaves, which are divided into five multifid lobes acute at the end; the calyxes are awned, and the arils are ſmooth. The peduncle is very long, and the lobes of the leaves are doubly trifid. *Jagged Craneſbill*[f] has the leaves divided into five parts, and each of thoſe into three acute ſegments; the petals are of the length of the calyx, and notched, and the arils are villous: this has the leaves more and finer cut than any of the others.

Of the laſt ſection, with one-flowered peduncles, we have a handſome ſort wild, but not common, with orbicular leaves, divided into five or ſeven parts, and each of thoſe into three: the flowers ſtand on long hairy peduncles, the corollas are large, and of a deep purple[g]. Many more ſpecies are known to the curious[h]; but I have only ſelected ſuch as the fields, the garden, and your little conſervatory, are moſt likely to afford.

[e] Geranium Columbinum *Lin.* Vaill. par. t. 15. f. 4. Petiv. 64. 8.

[f] Geranium diſſectum *Lin.* Vaill. par. t. 15. f. 2. Petiv. 64. 6.

[g] Geranium ſanguineum *Lin.* Bloody Craneſbill. Ger. 945. 2. Petiv. 64. 9.

[h] See ſome figured in Curtis's Magazine, n. 18 20, 55, 56, 95, 103, 136.

I have mentioned that Linnæus has ſubdivided this unwieldy genus from the number of effective ſtamens. A celebrated modern author has, from this circumſtance, made three diſtinct genera out of this one. 1. *Erodium*, containing the *Myrrhina* of Linnæus, or the Geraniums with five perfect ſtamens only. 2. *Pelargonium*, comprehending the *Africana* of Linnæus, or ſuch as have ſeven perfect ſtamens. 3. *Geranium*, taking in the remaining ſpecies, which anſwer exactly to the character of the order in having all the ten ſtamens with anthers, and which Linnæus had called *Batrachia*. Rivinus long ſince ſeparated this natural genus into two, from the regularity or irregularity of the corolla. I ſhall not diſpute whether all this be right or not. It is my deſign to explain the ſyſtem of the illuſtrious Swede as he left it.

Brownea. In this claſs we find a ſingular plant, which has naturally eleven ſtamens; a number which you did not find among the claſſes. Having the Monadelphic character, it here forms the order *Endecandria*, and ſtands alone. Being a plant little known, I inſiſt no longer on it [i].

The laſt order *Polyandria* is much the moſt conſiderable in number of genera and ſpecies. You have here *Silk-Cotton* [k], the

[i] Brownea coccinea *Lin.* [k] Bombax *Lin.*

True

True Cotton [l], ſo much uſed in our manufactures, the numerous genus of *Sida* or *Indian Mallow*, *Althæa* or *Marſh-Mallow*, *Alcea* or *Hollyhock*, *Mallow*, *Lavatera*, *Hibiſcus*, &c. The two firſt, with Sida and Hibiſcus, have one piſtil only; the reſt have many. Sida and Bombax have a ſingle calyx, but all the others have it double. The exterior calyx in Cotton and Lavatera is trifid; in Mallow conſiſts of three leaflets; in Alcea is ſexfid; in Hibiſcus octofid; in Althæa novemfid. Lavatera, Mallow, Alcea and Althæa, agree in having many ſeeds in a ring round a column, each covered with its proper aril. The ſeed-veſſel of Hibiſcus is a capſule compoſed of united cells including many ſeeds.

The officinal [m] ſpecies of Marſh-Mallow is known by its ſimple downy leaves, hoary to the ſight, and very ſoft to the touch; they are angular, but not divided to the bottom, and therefore ſimple. The flowers are like thoſe of the Mallow, but ſmaller and paler. Althæa.

Of Mallow there are many ſpecies: that which is ſo very common [n], has an erect herbaceous ſtem; five or ſeven-lobed acute leaves with both petioles and peduncles Malva.

[l] Goſſypium *Lin.*

[m] Althæa officinalis *Lin.* Fl. dan. 530. Mor. hiſt. ſ. 5. t. 19. f. 12. Ger. 933. 1. Park. 304. 1.—Pl. 22. f. 1.

[n] Malva ſylveſtris *Lin.* Curtis, Lond. II. 51. Ger. 930. 1. Pl. 22. f. 2.

hairy. *Dwarf Mallow*[o] has a proſtrate ſtem; orbiculate leaves hollowed next the petiole, obſcurely five-lobed; the fruit-bearing peduncles declining. This is every way a ſmaller plant. *Vervain Mallow*[p] has an erect ſtem, rough with ſpreading hairs in bunches, many-parted roughiſh leaves, the lobes of which are obtuſe and indented; the flowers large, and light purple. Another wild ſpecies called *Muſk Mallow*[q], is very like this, but has the radical leaves kidney-form and gaſhed; the ſtem-leaves five-parted, and the diviſions finely cut into narrow ſegments: the flowers have a muſky ſmell, and the ſtem has ſingle erect hairs ſitting on a prominent point. *Cape Mallow*[r] has an arboreſcent ſtem ten or twelve feet high, and the leaves five-lobed and hollowed at the baſe. The whole plant is hairy, and theſe hairs exude a viſcid aromatic juice. The flowers are deep red, and ſmaller than thoſe of the common Mallow. The trivial name informs us of its country, and conſequently that it ſtands in need of protection from you.

Alcea. The gigantic, the gaudy *Hollyhock* is of the genus *Alcea*: there are many varieties

[o] Malva rotundifolia *Lin.* Curtis, Lond. III. 43. Fl. dan. 721. Ger. 930. 2. Park. 299. 1.

[p] Malva Alcea *Lin.* Blackw. 309.

[q] Malva moſchata *Lin.* Curtis, Lond. IV. 50. Morhiſt. ſ. 5. t. 18. f. 4.

[r] Malva capenſis *Lin.* Dill. elth. t. 169. f. 206.

with

with double flowers, and different colours, as white, red of all hues from pale carnation to almoſt black, and yellows of different ſhades; but there are only two ſpecies[s], the firſt having roundiſh leaves, cut at the extremity only into angles; the ſecond palmate, cut deeply into ſix or ſeven ſegments, like the fig-leaf. Of the firſt there is a dwarf variety with variegated flowers, much eſteemed, and called *Chineſe Hollyhock.*

The ſhrub vulgarly named *Althæa Frutex* is an Hibiſcus; a very numerous genus, comprehending no leſs than thirty-ſix ſpecies, moſt of them inhabitants of either India, and not generally known here. The *Althæa Frutex*[t] however is a native of Syria, and bears the rigour of our climate, though it is very late ere it produces its flowers. The ſpecific characters are, an arboreous or woody ſtem, and wedge-ſhaped leaves, divided at top into three lobes, and ſtanding on ſhort petioles. The flowers are bell-ſhaped, and of various colours—pale or bright purple with dark bottoms, white with purple bottoms, variegated with dark bottoms, and yellow with the ſame: theſe flowers being large, gay, and numerous, make a handſome appearance, and give the compleateſt idea of the claſſical character. Hibiſcus.

China Roſe alſo, notwithſtanding its name,

[s] Alcea roſea Mill. illuſtr.—& ficifolia *Lin.*
[t] Hibiſcus ſyriacus *Lin.* Curt. Magaz. 83.

is no Roſe, but an *Hibiſcus* [u], with a woody ſtem, and ovate, ſharp-pointed leaves, ſerrate about the edges; the colour, ſize, and appearance of the flowers, when they are double, gave occaſion to the name of Roſe: they frequently appear on Chineſe paintings and paper, and are certainly very ornamental. The *Muſk plant* [v] of the Weſt Indies is another ſpecies of *Hibiſcus*; its kidney-ſhaped ſeeds have a very ſtrong ſmell of muſk. The bark of ſome ſpecies [w] is formed of fibres ſtrong enough for cordage. One of them is cultivated in the Weſt Indies for its pods, which they put into their ſoups [x]. But all this we have nothing to do with as botaniſts.

[u] Hibiſcus Roſa Sinenſis *Lin.* Rheed. mal. 2. t. 17.
[v] Hibiſcus Abelmoſchus *Lin.* Mer. Surin. t. 42.
[w] Hibiſcus vitifolius & Sabdariffa *Lin.*
[x] Hibiſcus eſculentus *Lin.* Sloan. jam. 1. t. 133. f. 3.

LETTER

LETTER XXV.

THE CLASSES DIADELPHIA AND POLYADELPHIA.

June the 4th, 1776.

AFTER a ſhort excurſion, we are returned, dear couſin, among your old acquaintance; and you have only to apply to the term *Diadelphia*, which is the name of the ſeventeenth claſs in Linnæus's ſyſtem, all the knowledge you firſt acquired from the letter on Papilionaceous flowers[y], and which you have ſince increaſed ſo much by your obſervation and experience. You have admired the ſingularly admirable and beautiful ſtructure of theſe flowers, in which all the plants of this claſs agree: you will now not be diſpleaſed to accompany me in an enquiry into their generic and ſpecific differences. The number of genera in this claſs is 57, of ſpecies 695. The orders are four, taken from the number of ſtamens, which in the firſt order is five, in the ſecond ſix, in the third eight, and in the fourth ten. In the order *Pentandria* however there is only one genus; in the order *Hexandria* two; and in the order *Oc-*

[y] Letter III.

tandria

tandria three; ſo that you perceive the laſt *(Decandria)* abſorbs the far greater part of the claſs; and what you have learnt of Papilionaceous flowers belongs indeed principally to this order. Of the three firſt orders there are only two genera, which you will have an opportunity of obſerving; and we will begin if you pleaſe with them.

Fumaria. *Fumitory* has two filaments, each of them terminated by three anthers; it has the claſſical character therefore, and muſt be of the order *Hexandria.* This genus has, beſides this, a two-leaved calyx, a ringent rather than a papilionaceous corolla, the upper lip however anſwering to the banner, the lower lip to the keel, and the bifid chaps to the wings: the baſe of each lip is prominent, but the upper one the moſt; and one filament is incloſed in each. *Common Fumitory*[2] which you will readily meet with as a weed in your kitchen garden, is known by a weak, diffuſe, branching ſtem, multifid leaves dividing into three, and the lobes trifid: the flowers growing in a raceme, and each being ſucceeded by a round or rather obcordate one-ſeeded pericarp.

Polygala. *Milkwort* has eight filaments, each terminated with an anther, and all united at bottom: it appertains therefore to the order *Octandria* of this claſs. The characters of the genus are, a five-leaved calyx, with

[2] Fumaria officinalis *Lin.* Curtis, Lond. II. 52. Ger. 1088. 1. Park. 287. 1.

two of the leaflets like the wings of the papilionaceous flower, and coloured: the banner of the corolla is cylindric; the legume is obcordate, or inverſe-hearted, and two-celled. Many of the ſpecies have a beard, creſt, or pencil-formed appendage to the keel; thoſe which have none are called beardleſs: and hence a commodious ſubdiviſion of this large genus; the laſt are ſubdivided into ſhrubby and herbaceous; the herbaceous again into ſimple and branched. Of thirty-eight ſpecies we have only one wild, and that is common on dry paſtures and heaths [a]: it is of the creſted diviſion, and bears the flowers in a raceme; the ſtem is herbaceous, ſimple, and procumbent, and the leaves are linear. This is a lowly plant, with pretty flowers, blue, red or white. There is a beautiful ſpecies [b] in the green-houſe, from the Cape, with a ſhrubby ſtem; oblong, ſmooth leaves, blunt at the end; and handſome flowers, large, white on the outſide, but bright purple within; the keel creſted, and ſhaped like a half moon. *Senega* [c] root, ſo famous among the American Indians as an antidote to the bite of the rattle-ſnake, is from a ſpecies of this genus.

The plants of the order we are now to

[a] Polygala vulgaris *Lin.* Fl. dan. 516. Ger. 564. 5. Park. 1332. 2.

[b] Polygala myrtifolia *Lin.* Mill. illuſtr.

[c] Polygala Senega *Lin.* Mill. Dict.

examine

examine are obvious, not only by their papilionaceous flowers, but by their compound leaves, which in the greater part are pinnate, winged, or feathered, but in others trifoliate [d]. In ſome genera the pinnate leaves have the leaflets in pairs only [e], but it is more common to have them terminate in an odd one [f]. Many of this pulſe tribe have ſtems too weak to ſuſtain themſelves, they fly therefore to ſome ſtronger plant or other prop for ſupport, and they are furniſhed with the neceſſary means of helping themſelves, either by twining their ſtalks about and embracing their friend [g], or elſe by throwing out ſlender threads, like the vine, called *claſpers* or *tendrils*, by which they lay faſt hold [h].

Moſt of theſe plants having fruits that are eſculent either to us, to quadrupeds or to birds, produce flowers in great abundance, and cloſe bunches; in ſome of the genera they grow in a kind of umbel [i], much like

[d] As in Trifolium or Trefoil, which has its name from this circumſtance, Lotus, Medicago, Erythrina, Geniſta or Broom, Cytiſus, Ononis, Trigonella, Phaſeolus or Kidney Bean, Dolichos and Clitoria.

[e] Orobus, Piſum or Pea, Lathyrus or Everlaſting Pea, Vicia or Vetch, Ervum and Arachis.

[f] Biſerrula, Aſtragalus, Phaca, Hedyſarum, Glycyrriza or Liquorice, Indigofera or Indigo, Galega, Colutea, Amorpha and Piſcidia.

[g] Phaſeolus, Dolichos, Clitoria, Glycine.

[h] Piſum, Lathyrus, Vicia, Ervum.

[i] Lotus, Coronilla, Ornithopus, Hippocrepis, Scorpiurus.

thoſe

thoſe of the ſecond order of the fifth claſs. I mention theſe circumſtances, not as claſſical characters, but as leading features that may give you a ſhrewd ſuſpicion, rather than a certain aſſurance. When you find a plant endued with ſome of theſe ſubordinate characters, you, I am certain, will not determine it at once upon them: no, they will only lead you to a more ſtrict examination. Neither pinnate or trifoliate leaves, weak twining or climbing ſtems, nor even papilionaceous flowers, will ſatisfy your diſcerning eye, till you have ſeen the union of the filaments at bottom. If you can procure any ſpecies of *Sophora*[k], you will be convinced of this; for without ſuch caution you would infallibly have been miſled; this genus agreeing with the pulſe tribe in every reſpect, except in having the ten filaments diſtinct.

The proper character of this claſs, you know, is to have the filaments in two diſtinct bodies; and the character of the order *Decandria* is to have nine filaments united at bottom into a membrane ſurrounding the germ, and the tenth ſingle, filling up the opening which is left for the germ to diſengage itſelf, when it has arrived at a ſtate proper to paſs into a pod or legume. I muſt advertiſe you however that this is not ſtrictly

[k] A genus of the claſs *Decandria* and the order *Monogynia*. Anagyris, Cercis, &c. have alſo the ſame appearance.

true

true of all the genera; there are no fewer than eighteen out of fifty, which have all the ten filaments connected, ſo that the germ cannot grow into a legume without tearing aſunder the membrane formed of the filaments. You muſt not therefore be deterred from ſetting down a plant as of the Pulſe tribe, and of the claſs *Diadelphia*, when you find the ten filaments united into *one*, incloſed within a papilionaceous flower, and furniſhed with the other marks of the claſs. Of thoſe which anſwer regularly to the claſſical character, ſome have a pubeſcent ſtigma[l], and the reſt are diſtinguiſhed by their legumes, as we ſhall now ſee; for we are going to examine their diſtinctive marks more narrowly.

Spartium. You will obſerve in this claſs ſome trees, and many ſhrubs, with papilionaceous flowers, as *Common*[m] and *Spaniſh*[n] Broom; both of a genus in which the ten filaments are all united, and form a membrane adhering cloſe to the germ: the ſtigma grows along the upper ſide of the top of the ſtyle, and is villous; the calyx is continued downwards, and is marked beneath with five little notches at the tip. *Spaniſh Broom*, with ſome other ſpecies, has ſimple leaves, in the reſt they are ternate, trefoil, or three-

[l] Colutea, Phaſeolus, Dolichos, Orobus, Piſum, Lathyrus, Vicia.

[m] Spartium ſcoparium *Lin.* Curt. Lond. V. 52. Fl. dan. 313. Blackw. 244. Ger. 1311. 1. Park. 229. 1.

[n] Spartium junceum *Lin.* Curt. Magaz. 85.

leaved.

leaved. In *Common Broom* however there is a mixture of both. In the firſt alſo the leaves are lance-ſhaped, and the ruſh-like branches are oppoſite, round, and produce the flowers from the top, in a looſe ſpike. In the ſecond the branches are angular, and the flowers come out ſingly for a conſiderable length towards the top. They are large, and of a bright yellow in both ſpecies. There is alſo a Spaniſh Broom with a white flower [o]; which has leaves like the other, but the branches ſtriated, and the flowers in ſhort ſpikes or cluſters on the ſides of them; they are ſucceeded by large oval pods containing one ſeed, whence the trivial name. *Portugal Brooms* with trifoliate leaves and yellow flowers, differing little from ours: and a ſort with prickly branches, thence called *Prickly Cytiſus* [p].

We have ſome wild ſhrubs of an humbler growth, ſomewhat reſembling theſe, but of another genus called *Geniſta*; the characters of which are a two-lipped calyx, the upper lip two-toothed, the lower three-toothed; the banner of the corolla oblong and turning downwards from the piſtils and ſtamens; the piſtil depreſſing the keel, and the ſtigma involute. *Dyer's weed*, called alſo *Wood-waxen* and *Baſe Broom* [q], which Geniſta.

[o] Spartium monoſpermum *Lin.*

[p] Spartium ſpinoſum *Lin.*

[q] Geniſta tinctoria *Lin.* Fl. dan. 526. Ger. 1316. 1. Park. 229. 7.

grows

grows in paſtures and headlands, has ſmooth lance-ſhaped leaves, and erect, round, ſtreaked branches. *Needle Furze* or *Petty Whin*[r], which you will find wild on heaths, has ſmall lance-ſhaped leaves, ſlender branches armed with long, ſimple ſpines; the flower branches are ſhort, have no ſpines, and have five or ſix flowers in a cluſter at the end of them: the colour of the corolla in both ſpecies is yellow; and you would at firſt ſuppoſe that the former was a *Spartium*, and the latter a Furze, or
Ulex. of the genus *Ulex*; which however differs from both in having a two-leaved calyx, with the legume ſo ſhort as ſcarcely to emerge from it. We have only one ſpecies, than which nothing, as you know, is more common on all our heaths; it has the three different names of *Furſe*, *Gorſe* and *Whins*[s], in different parts of the kingdom.

Ononis. *Reſtharrows* are a lowly kind of ſhrubs, or rather underſhrubs, with purple flowers, growing on commons, barren paſtures, and headlands of corn-fields; they have the name from the ſtrength and matting of the roots, which circumſtance has induced the Dutch to ſow them on their ſea-banks. The cylinder of filaments is quite entire at bottom, without any fiſſure, in this genus;

[r] Geniſta anglica *Lin.* Fl. dan. 619. Ger. 1320. 4. Park. 1004. 4.

[s] Ulex europæus *Lin.* Fl. dan. 608. Ger. 1319. 1. Park. 1004. 1.

the

the calyx is parted into five linear diviſions; the banner of the corolla is ſtriated; and the legume, a ſection of which is a rhomb, is turgid and ſeſſile. We have two ſorts, one [t] with prickly ſmooth branches, and the flowers in a raceme, but coming out ſingly: the other [u] with villous leaves and branches, but without ſpines; the flowers in a raceme, but generally two together; both have ternate leaves, except that towards the top they are ſimple.

In *Anthyllis* the calyx is turgid, and includes the legume, which is ſmall and roundiſh, containing one, or at moſt two ſeeds. The only ſpecies we have wild is herbaceous, is called *Ladies-Finger* or *Kidney-Vetch* [v], and is not uncommon in chalky paſtures; it has unequally pinnate leaves, and a double head of yellow flowers, but this latter character is not conſtant. The leaves are pubeſcent, and conſiſt of three or four pair of leaflets; except two under the umbel, which are digitate. There are ſeveral flowering-ſhrubs of this genus; as that which is generally called *Jupiter's beard* or *Silver buſh* [w], from the ſplendid whiteneſs of the leaves, which is owing to a fine nap Anthyllis.

[t] Ononis ſpinoſa *Hudſoni*. Common, ſmooth, or prickly Reſtharrow. Blackw. t. 301. Ger. 1322. 1.

[u] Ononis inermis *Hudſoni*. Hairy Reſtharrow. Ger. 1322. 3.

[v] Anthyllis Vulneraria *Lin.* Rivin. t. 18. Ger. 1240. 1.

[w] Anthyllis Barba Jovis *Lin.* Mill. fig. t. 41. f. 2.

or down that covers them; they are equally pinnate: the flowers are produced at the extremity of the branches, in ſmall heads, and are yellow.

Lupinus. *Lupins*, which are ſo well known in the flower-garden, agree in a two-lipped calyx, in having five of the anthers round, and five oblong, and in the ſhell of the legume being coriaceous or leathery. The common *white* [x] ſort, which is cultivated as a pulſe in moſt of the ſouthern parts of Europe, has the flowers growing alternate, without appendages; the upper lip of the white corolla is entire, the lower three-toothed: the ſeeds are orbiculate and flatted. There are three ſorts with blue flowers: the *Perennial* [y], which is the only one that is not annual, with alternate, unappendaged flowers; the upper lip of the corolla notched, the lower one entire. This is an American plant: the digitate leaves are compoſed of ten or eleven leaflets, whereas thoſe of the former have no more than ſeven or eight: the flowers grow in long looſe ſpikes, and are pale blue. The *great blue* [z], with alternate appendaged flowers; the upper-lip two-parted, the lower three-toothed. This has a ſtrong ſtem, covered with a ſoft browniſh down; the leaves have nine, ten, or eleven hairy, ſpatulate leaf-

[x] Lupinus albus *Lin.* Riv. tetr. Blackw. 282.
[y] Lupinus perennis *Lin.* Mill. fig. 170. 1.
[z] Lupinus hirſutus *Lin.*

lets

lets: the flowers are in whorls, forming a ſort of ſpike; they are large, and of a beautiful blue: the pods are very large, and have three roundiſh compreſſed ſeeds, very rough and of a purpliſh brown. *Narrow-leaved* or *tall blue Lupin* [a], has the flowers alternate and appendaged or pedunculate; the upper lip of the corolla two-parted, the lower three-toothed: the lobes of the leaves are linear. The *Varied* [b] is not very different in appearance from this: the flowers grow in half whorls, and are appendaged; the upper lip is bifid, and the lower ſlightly three-toothed: the corollas are light blue or purple. It is ſhorter than the laſt; the leaves have fewer leaflets, and ſtand on ſhorter petioles. The *Hairy* [c] has the flowers in whorls and appendaged, with the upper lip two-parted, like the Great Blue Lupin; which it much reſembles in ſtature and appearance; but the corollas are fleſh-coloured with the middle of the banner red, the lower lip is entire; the plant is hairy all over, and the leaves are lance-ſhaped, and a little obtuſe at the end. The *Yellow* [d] is eſteemed for the ſweetneſs of its flowers: they grow in whorls and on peduncles; the upper lip of the corolla is two-parted, the lower three-toothed. Thus

[a] Lupinus anguſtifolius *Lin.* Riv. tetr.
[b] Lupinus varius *Lin.*
[c] Lupinus piloſus *Lin.*
[d] Lupinus luteus *Lin.* Riv. tetr.

have you a hiſtory of the whole genus of Lupin; for theſe are all the ſpecies hitherto known: and as you may eaſily have them growing together, you may compare them at leiſure, and aſcertain all their agreements and differences: could we do this in every genus, how clearly might we diſtinguiſh the ſpecies! but remember that culture may produce fictitious characters, which miſlead unwary botaniſts.

In all the genera hitherto examined, the filaments have made one body at bottom; in the reſt, which I ſhall now offer to your conſideration, nine only are united, and the tenth is free, according to the proper character of the claſs. We will begin with ſome genera, diſtinguiſhed (as I mentioned before) by a pubeſcent ſtigma. *Phaſeolus* or *Kidney Bean*, in having the keel with the ſtamens and ſtyle ſpirally twiſted, poſſeſſes one obvious character, that diſcriminates it ſufficiently from all its congeners. Some of the ſpecies have an outer calyx, conſiſting of two roundiſh leaflets, which may more properly be called *bractes*. *Lathyrus* or *Everlaſting Pea* has a flat ſtyle, villous above, growing broader upwards: in this it differs from the *Pea*, which has a triangular ſtyle keeled above: both genera have the two upper diviſions of the calyx ſhorter than the other three, and, in other reſpects, are very nearly allied. Some ſpecies of *Lathyrus* have one flower only on a peduncle:

Phaſeolus.

Lathyrus.

peduncle: of theſe we have two wild ones; one with yellow flowers, ſupporting itſelf among the corn by leafleſs tendrils, and having broad ſtipules ſhaped like the head of an arrow: the other with crimſon flowers, long narrow leaves difficult to be diſtinguiſhed from the graſs among which it grows, and ſmall, ſubulate or awled ſtipules. The firſt is called *Yellow Vetchling* [e]; the ſecond, *Crimſon Graſs Vetch* [f]. *Sweet Scented Pea* [g], with ſome few others, has two flowers on every peduncle; each tendril has a pair of oblong ovate leaves, and the legumes are rough. The banner of the corolla is dark purple, the keel and wings light blue; but there are varieties; one all white, and another with a pink banner, wings of a pale bluſh, and a white keel; this is called *Painted Lady Pea*. *Tangier Pea* [h], another of the *biflorous* ſection, has the two leaves alternate, lance-ſhaped and ſmooth; the ſtipules ſhaped like a creſcent. The flowers grow on ſhort peduncles; have a purple banner, with wings and keel of a bright red, and are ſucceeded by long

[e] Lathyrus Aphaca *Lin.* Mill. fig. pl. 43. Curtis, Lond. V. 51. Ger. 1250. Park. 1067.

[f] Lathyrus Niſſolia *Lin.* Ger. 1249. 2. Park. 1079. 4.

[g] Lathyrus odoratus *Lin.* Curtis magaz. 60.

[h] Lathyrus tingitanus *Lin.* Jacq. hort. t. 46. Curt. magaz. 100.

jointed pods. *Everlaſting Pea*[i] is of the laſt diviſion, having many flowers produced on one peduncle: this has alſo conjugate leaves, that is, growing in pairs, furniſhed with a tendril or claſper; the form of the leaves is elliptic or oval; and the ſtems, which climb very high, have membranaceous wings on each ſide between the joints; the flowers are red. There is a variety of this in the gardens, with broader leaves, larger and deeper coloured flowers. There is another ſort not very different from this[k], having ſword-ſhaped leaves; and a third[l], growing in woods, bogs, and wet meadows, which has many-leaved tendrils, and lance-ſhaped ſtipules: the leaflets are ſix; and there are from three to ſix flowers on each peduncle; the corolla is blue, with the greateſt part of the wings and keel white. One ſpecies of this ſection[m], with yellow flowers, two-leaved tendrils, which are extremely ſimple, and lance-ſhaped leaves, is very common in paſtures, hedges, and woods.

Vicia. *Vetch* or *tare* is ſufficiently diſtinguiſhed by having a ſtigma tranſverſely bearded on

[i] Lathyrus latifolius *Lin.* Mill. fig. pl. 160. Mill. illuſtr. Fl. dan. 785. Pl. 23.

[k] Lathyrus ſylveſtris *Lin.* Fl. dan. 325. Mor. hiſt. ſ. 2. t. 2. f. 4. Ger. 1229. 1.

[l] Lathyrus paluſtris *Lin.* Fl. dan. 399.

[m] Lathyrus pratenſis *Lin.* Curtis, Lond. III. 44. Ger. 1231. 6. Park. 1061. 1.

the

the under ſide. The ſpecies, which are eighteen in number, may be ranged under two diviſions, the firſt comprehending ſuch as have flowers in bunches on peduncles; the ſecond, thoſe which are axillary, or have the flowers ſitting almoſt cloſe to the ſtem, and coming out from the angle which the leaves form with it. Of the firſt diviſion we have the *Tufted* [n] and *Wood Vetch* [o] wild: both having flowers in bunches many together, but in the firſt imbricate; in this alſo the leaflets or component leaves are lance-ſhaped and pubeſcent, and the ſtipules entire: in the ſecond, the leaflets are oval, and the ſtipules ſlightly toothed. The cultivated, and ſeveral wild ſorts, are of the ſecond diviſion. The firſt [p] has erect, ſeſſile legumes, moſtly two together; the leaves are retuſe, and the ſtipules ſpotted. Of the others, *Spring Vetch* [q], which is very nearly related to the former, has however the legumes generally ſingle; the lower leaflets retuſe, the upper ones narrow, and almoſt linear: the leaflets are from four to ten; and the ſtipules are ſpotted, as in the former. *Buſh Vetch* [r]

[n] Vicia Cracca *Lin.* Curtis, Lond. V. 54. Fl. dan. 804. Mor. hiſt. ſ. 2. t. 4. f. 1.

[o] Vicia ſylvatica *Lin.* Fl. dan. 277.

[p] Vicia ſativa *Lin.* Fl. dan. 522. Mor. t. 4. f. 12. Ger. 1227. 1, 4.

[q] Vicia lathyroides *Hudſ.* Fl. dan. 58.

[r] Vicia dumetorum *Lin.* Riv. tetr. 50.

has about four erect legumes growing together on ſhort pedicles: the leaflets are ovate, and quite entire; they decreaſe in ſize towards the end of the leaf: it ramps in hedges. The *Bean*[s] is placed by Linnæus in the Vetch genus; and very juſtly, ſince it agrees with them in the characters of the fructification, and differs only in having a ſtouter ſtalk that ſupports itſelf, and therefore is not furniſhed with tendrils. Its native place of growth is ſuppoſed to be not far from the Caſpian Sea, on the borders of Perſia. All the different ſorts of Bean are in reality but varieties from the ſame original ſtock: you underſtand me to ſpeak of Beans properly ſo called, in excluſion of Kidney Beans and others, which are not merely ſpecifically different, but alſo of another genus.

Colutea. Of the ſame ſection, with pubeſcent ſtigmas, is a genus of well known ſhrubs called *Colutea:* diſtinguiſhed by their quinquefid calyx; and inflated legume, opening from the baſe by the upper ſuture; the Engliſh name of *Bladder-Sena* is taken from the latter character. *Common Bladder-Sena*[t] has an arboreous ſtem, and inverſely-hearted leaves. It grows twelve or fourteen feet high; its winged leaves have four or five pair of grayiſh leaflets; the flowers

[s] Vicia Faba *Lin.*

[t] Colutea arboreſcens *Lin.* Curt. Magaz. 81.

come

come out from the axils, two or three together, on ſlender peduncles; they are yellow with a dark-coloured mark on the banner. This grows wild in the ſouthern countries of Europe. There is another, which comes from the Eaſt, and has flowers like this, only of a brighter yellow; differing in being a much lower ſhrub, and in having nine pair of ſmall, oval, entire leaflets to each leaf. A third, about the ſame height with the ſecond, but with branches ſtill more ſlender, comes from the ſame country: the leaves of this have five or ſix pair of ſmall heart-ſhaped leaflets; the flowers are ſmaller, and of a dark red, marked with yellow. It is a doubt whether theſe be ſpecifically different from the firſt [u]: there is however one from Æthiopia, with ſcarlet flowers, which is very diſtinct [v]: for it is a low, weak ſhrub, with leaves compoſed of ten or twelve pair of oblong-ovate, hoary leaflets: the flowers are long, owing to the length of the keel, for the banner is ſhorter than that, and the wings are minute. You will eaſily ſuppoſe, from its country, that it cannot ſtand the cold of a ſevere winter with us; it does not ſhrink however from a mild one, in a dry ſoil and warm ſituation. There is alſo an herbaceous ſpecies [w], with ſmooth

[u] Figured in Comm. rar. t. 11. and Mill. fig. 100.
[v] Colutea fruteſcens *Lin.* Mill. fig. pl. 99.
[w] Colutea herbacea *Lin.* Comm. hort. 2. t. 44.

linear

linear leaflets; but this is an annual plant of little beauty, and therefore rarely cultivated.

Cytiſus. There are ſeveral other ſhrubs of the Pea-bloom tribe: as the different ſpecies of *Cytiſus*, of which *Laburnum*[x] is one. This is known by yellow flowers hanging in large ſimple racemes, and three oblong-ovate leaflets to each leaf. There is a variety with narrower leaves, and longer bunches of flowers, more common in ſhrubberies than the firſt, which is a larger tree, and comes to excellent timber; but this making a better appearance when in flower, is preferred in ornamental plantations. *Seſſile-leaved Cytiſus*[y], vulgarly called *Cytiſus ſecundus Cluſii*, has the flowers in ſhort, erect racemes, at the ends of the branches; each flower has a little triple bracte at the baſe of the calyx; the leaves on the flowering branches are ſeſſile, but the others are petiolate. The flowers are of a bright yellow, and the pods are ſhort, broad, and black. *Evergreen Cytiſus*[z] has the flowers coming out ſingly from the ſide of the ſtalk, with very hairy, trifid, obtuſe, oblong, ſwelling calyxes; the ſtalks extremely hairy; the leaves alſo hairy, eſpecially underneath. The flowers are pale yellow; and the pods long, narrow, and rough.

[x] Cytiſus Laburnum *Lin.* Jacq. auſtr. 4. t. 306.
[y] Cytiſus ſeſſilifolius *Lin.* Duham. arb. 1.
[z] Cytiſus hirſutus *Lin.* Jacq. obſ. 4. 96.

All

All theſe, and the reſt of the ſpecies, agree in a two-lipped calyx, the upper lip bifid, the lower three-toothed; and a legume attenuated at the baſe; and pedicled, with ſeveral ſeeds in it. The leaves are ternate.

Robinia has a quadrifid calyx; an expanding, reflex, roundiſh banner; and a gibbous, elongate legume, containing ſeveral ſeeds. The tree which you admire for its long racemes of ſweet-ſmelling white flowers, hanging down like thoſe of Laburnum, is of this genus: I mean the *Baſtard Acacia*[a], called in North America, its native country, *Locuſt-tree*. The leaves are pinnate, conſiſting of eight or ten pair of oval leaflets terminated by an odd one; all entire, and ſitting cloſe to the mid-rib: the ſtipules are armed with ſtrong, crooked thorns; and the flowers come out ſingly, or only one on a pedicle in the racemes. The *Caragana*[b], a Siberian ſhrub, has leaves abruptly pinnate, that is, winged, not terminated by an odd leaflet; they have four or five pairs of oval leaflets: this has no ſpines, and the yellow flowers come out ſingly from the axils. There are ſeveral other trees and ſhrubs of this genus; but theſe are the moſt known. Robinia.

[a] Robinia Pſeudacacia *Lin.* Seba mus. 1. t. 15. f. 1. Duham. arb. 2. t. 42.

[b] Robinia Caragana *Lin.* Duham. arb. 3.

Coronilla

Coronilla. *Coronilla* is another genus of ſhrubs comprehending however ſome herbaceous plants. They all agree in a two-lipped calyx; the upper lip having two, the lower three little teeth; the ſuperior teeth conjoined; in a banner ſcarcely longer than the wings; and in a very long, ſtraight legume, contracted between the ſeeds, and, inſtead of opening by the ſutures, falling off in joints.—*Scorpion Sena*[c] is a ſpecies of this genus very common among ſhrubs: it is immediately known, by having the claws of its yellow corollas three times as long as the calyx; two or three flowers come out together upon long peduncles from the ſides of the branches, which are ſlender, and angular: the leaves are pinnate, and compoſed of three pair of leaflets terminated by an odd one: the legumes are long, ſlender, taper, and pendulous; the ſeeds cylindric. There are ſeveral beautiful ſhrubs of this genus, but too tender to bear the open air in our climate.

Indigofera. The plants from which indigo is made[d] are of this claſs; and many of the kindred genera reſemble them in quality as well as outward form and character. Scorpion Sena in particular, it is ſaid, will yield a dye nearly equal to indigo, if the leaves are fermented in a vat in the ſame manner as is

[c] Coronilla Emerus *Lin.* Mill. fig. 132.
[d] Indigofera *Lin.* Mill. fig. 34.

practiſed

practiſed with thoſe plants; and you remember complaining perhaps, that the yellow flowers of the Lotus would turn blue in drying, unleſs you took care to keep them ſeparate from other plants, and to change them often.

Liquorice is alſo of the ſame claſs: it has a two-lipped calyx, with the upper lip divided into three parts, and the lower abſolutely ſimple and undivided; the legume is ovate and compreſſed, with very few kidney-ſhaped ſeeds. The ſpecies which is cultivated for the ſake of its roots [e] has ſmooth legumes, no ſtipules, and pinnate leaves conſiſting of four or five pairs of leaflets, terminated by an odd one, which is petiolate. It is a lofty plant for an herbaceous one, the ſtalks being from four to five feet high; the flowers come out in erect ſpikes from the axils, and are pale blue. Glycyrrhiza.

Hedyſarum is a moſt numerous genus, containing no fewer than ſixty-ſeven ſpecies, all however conſpiring in having the keel tranſverſely obtuſe, and the legume jointed, with one ſeed in each joint. The genus is ſubdivided into four ſections, from the leaves; which in the firſt are ſimple; in the ſecond, conjugate; in the third, ternate; and in the fourth, pinnate. I ſhall preſent you only two ſpecies, and they of Hedyſarum.

[e] Glycyrrhiza glabra *Lin.*

the

the laſt ſection. One tranſplanted from Italy into the gardens; and the other from a wild ſtate to a cultivated one. The firſt is the *French Honeyſuckle*[f], which is diſtinguiſhed from the reſt by a diffuſed ſtalk, and by its jointed, prickly, naked, ſtraight legumes; its pinnate leaves point it out to be of the fourth ſection: they have five or ſix pair of leaflets, terminated by an odd one; and from their baſe comes out a long peduncle, ſuſtaining ſpikes of beautiful red flowers. The other is the *Saintfoin*[g]; the characters of which are an elongated ſtem; the wings of the corolla equalling the calyx, and one-ſeeded prickly legumes: this has alſo, of courſe, pinnate leaves. It adorns the chalky hills with its beautiful ſpikes of red flowers; and contributes largely among many others of this claſs to feeding of cattle. For this the *Trefoils* are moſt juſtly celebrated; there are forty-ſix ſpecies of them, all having the flowers growing in a head; and the legume very ſhort, ſcarcely emerging from the calyx, not opening, but falling off entire, and containing but one, or at moſt two ſeeds. Though this be a genus eaſily diſtinguiſhed by its habit, yet the characters are by no means conſtant, and perhaps there is not one com-

Trifolium.

[f] Hedyſarum coronarium *Lin.*

[g] Hedyſarum Onobrychis *Lin.* Rivin. tetr. t. 2. Ger. 1243. 1. Park. 1082. 1.

mon to all the ſpecies. *White Trefoil*, commonly called *Dutch Clover* [h], has a creeping, perennial ſtem; the heads umbelled; and the legumes covered and four-ſeeded. *Purple Trefoil*, *Honeyſuckle Trefoil*, or *Red Clover* [i], has the flowers growing in globular ſubvillous ſpikes, girt with oppoſite membranous ſtipules; and the corollas all of one petal. There are many wild ſpecies of this genus; but the Yellow Trefoil, cultivated under this name, or that of *Noneſuch*, is of another genus, as we ſhall ſee preſently.

Lotus has a tubular calyx; the wings of the corolla clapping cloſe together upwards longitudinally; and an upright cylindric legume. The wild ſpecies is called *common Bird's-foot* [k], and is diſtinguiſhed by its decumbent ſtems, many flowers growing together in depreſſed heads; and exactly cylindric, ſpreading legumes. The corollas are of a bright yellow. Lotus.

Lucerne [l] is of the genus *Medicago*, the character of which is that the keel of the corolla bends down from the banner, and that the legume is flatted, and ſpiral or wreathed like the ſhell of a ſnail. The Medicago.

[h] Trifolium repens *Lin.* Curtis, Lond. III. 46. Ger. 1185. 1.

[i] Trifolium pratenſe *Lin.* Blackw. t. 20.

[k] Lotus corniculatus *Lin.* Curtis, Lond. II. 56. Ger. 1190. 5.

[l] Medicago ſativa *Lin.* Mor. hiſt. ſ. 2. t. 16. f. 2. Ger. 1189. 2. Park. 1114. 1.

ſpecific

ſpecific character is this—the ſtem is erect and ſmooth, the flowers grow in a raceme, and the legumes are contorted: the colour of the corollas is blue. The ſpecies cultivated under the name of *Trefoil* or *Nonſuch* [m] has the ſtems procumbent; the flowers in oval ſpikes; and the legumes kidney-form, with one ſeed only in each; the corollas are ſmall and yellow. In a cultivated ſtate the ſtems draw each other up, and loſe, in a great meaſure, their natural procumbency, as does alſo *Bird's-foot Trefoil*, when it has other plants about it, as in graſs-fields, &c. There is a ſpecies of *Medicago* called *polymorphous* or *many-form* [n], from the variety of appearances it puts on, or from the change of figure in the pod. We have one variety very common wild [o], called *Heart-Clover* from the form of the leaves, which are alſo generally ſpotted: each head conſiſts of four or five little yellow flowers; the legumes are globoſe, ſpiral, and covered with very diverging ſpines: and in the garden you have the vegetable *Snails* [p], with large, ſpiral, globoſe legumes, naked, or not covered with ſpines; and the *Hedge-*

[m] Medicago lupulina *Lin.* Curtis, Lond. II. 57. Ger. 1186. 5. Park. 1105. 6.

[n] Medicago polymorpha *Lin.*

[o] Medicago polymorpha arabica *Lin.* Curtis, Lond. III. 47. Ger. 1190. 4. Park 1115. 6.

[p] Med. polym. ſcutellata *Lin.* Mor. hiſt. ſ. 2. t. 15. f. 4.

hogs,

bogs [q], whoſe legumes are cloſely armed with long ſpines pointing every way. Theſe all have the ſtem diffuſe; the ſtipules toothed, and the legumes ſpiral. This claſs has alſo its vegetable *Caterpillars*, but they are of another genus [r].

I fear you will think I have already made this letter too long. However, as it may be ſome time before you hear from me again; as the next claſs is a very ſmall one, and completes the ſet of plants with united filaments, I will treſpaſs on your patience whilſt I go through it.

THE CLASS POLYADELPHIA.

The Claſs *Polyadelphia*, then, comprehends all ſuch flowers as have the filaments united at bottom into more than two parcels. The filaments are in bunches, or pencilled, as one might call it, ſince they are collected into bodies reſembling a camel's hair pencil. If you were not to attend to this character, you might eaſily ſuppoſe theſe plants to belong to the claſs *Polyandria*, for they have no ſtriking appearance, like the pulſe tribe and ſome others, announcing them immediately to range under this claſs.

There are four orders, taken from the

[q] Med. polym. intertexta. Mor. ſ. 7, 8, 9.
[r] Scorpiurus. Riv. tetr. 210.

ſtamens; *Chocolate* [s] is in the firſt, *Pentandria*, a genus called *Monſonia* in the ſecond: *Citron*, comprehending *Oranges* and *Lemons*, in the third; and eight genera in the fourth. The whole number of ſpecies is only ſixty-five.

Citrus. The beautiful, odoriferous, well known, and deſervedly eſteemed genus of *Citrus* has theſe characters—a ſmall calyx five-toothed at top; a corolla of five oblong petals; about twenty ſtamens, placed cylindrically round the germ, with the filaments connected rather ſlightly, ſometimes into more, ſometimes into fewer parcels; one piſtil, and, for a fruit, a berry generally nine-celled, with a bladdery pulp, in which the ſeeds are lodged.

You will have pleaſure in examining at leiſure the three elegant ſpecies of this genus, and in regaling your ſenſes, whilſt your mind imbibes inſtruction. When they are in fruit, you diſtinguiſh them immediately; but when they are not, you will find that the *Citron* [t] has the petioles linear or all of a ſize, like moſt other petioles; whereas the *Orange*, *Lemon*, and *Shaddock*, have the petioles winged in ſhape of a heart; ſo that the main leaf ſeems to grow out of a ſmaller one. Linnæus makes the

[s] Theobroma Cacao *Lin.* Sloan. jam. 2. t. 160. Merian. ſurin. t. 26. and 63. Cateſb. car. 3. t. 6.

[t] Citrus Medica *Lin.* Virg. georg. edit. Mart. p. 135.

Orange and *Lemon* [u] to be of one ſpecies, and to be diſtinguiſhed by pointed leaves from the *Shaddock* [v], which has them obtuſe, and emarginate or notched at the end: not to mention the great ſize of the fruit, the flowers of this grow more in racemes, which are alſo a little nappy or woolly. I dare preſume that you are by this time ſo great an adept in Botany as readily to admit, in ſpite of the information of your taſte to the contrary, that the Seville and China Oranges may be varieties of the ſame ſpecies, owing all their difference to climate. Neither perhaps do you find much difficulty in perſuading yourſelf, that the large and generous Lemon may not be ſpecifically different from the little, round, ſour Lime; notwithſtanding ſome little difference in the leaves, and the ſpines on the branches of the latter. But I much doubt whether you will be able to perſuade your fair daughter to admit that the auſtere, long, pale Lemon, is not a ſpecies totally diſtinct from the round, deep-coloured Orange, the flavour of whoſe juice ſhe enjoys with ſo much delight. I will conſent that ſhe ſhould enjoy her incredulity, at leaſt if ſhe can diſtinguiſh theſe trees when they are deſtitute of fruit. The poſition of the ſtamens informs you that this genus is of the order *Icoſandria*.

[u] Citrus Aurantium *Lin.* Mill. illuſtr.

[v] Citrus decumana *Lin.* Rumph. amb. 2. t. 24. f. 2.

Hypericum.

The genus *Hypericum*, in the laſt order (*Polyandria*) of this claſs, has many more ſpecies than all the other genera put together. Several of them are wild, and ſeveral others are commonly cultivated among ſhrubs: they are not however all ſhrubs, for many ſpecies are herbaceous. All plants do not exhibit the claſſical mark, in this or any other claſs, with equal evidence; in this genus the numerous ſtamens will eaſily ſeparate from the receptacle in pencils or parcels, and thus evidently ſhow what is their proper place in the ſyſtem. Being thus certified that your plant does not belong to the claſs *Polyandria*, but to this, you will eaſily diſtinguiſh it from its congeners, by its five-parted calyx including the germ; by its corolla of five petals; by the abundance of ſtamens, uſually forming five ſquadrons; and by the ſeed-veſſel being a capſule, divided into as many cells as there are ſtyles to the flower; theſe are either one, two, three, or five in number; and hence a ſubordinate diviſion of the genus into four ſections: there is however only one ſpecies with one ſtyle, and there are only two ſpecies with two; the far greater number have three: and among theſe are all the European ones.

Common St. John's wort[w] has two characters ſo remarkable that it cannot well be

[w] Hypericum perforatum *Lin.* Curtis, Lond. 1. 57. Mill. illuſtr. Ger. 539. 1. Park. 573. 1.

miſtaken,

miſtaken, as ſoon as they are underſtood: for it has an *ancipital* or two-edged ſtem, that is, roundiſh, or a little flatted, and running out longitudinally into two little edges or membranes oppoſite to each other: and its obtuſe leaves are punctured all over their ſurface, ſo as to appear, when held up againſt the light, as if they had been pricked with a pin. Another wild ſort not near ſo common, growing in moiſt hedges and woods, and called *Saint Peter's wort* [x] has ſquare ſtalks; it is about the ſame ſize with the other, but does not branch ſo much: the leaves are ſhorter and broader, and have none of the pellucid dots which are ſo remarkable in the former. *Trailing Saint John's Wort* [y] is a pretty little plant, found on dry paſtures and heaths: it has two-edged, proſtrate, filiform ſtems; ſmooth leaves; and axillary, ſolitary flowers. *Upright Saint John's wort* [z] is an elegant ſpecies, growing in woods and heaths; with columnar ſtems: ſtem-claſping, ſmooth, heart-ſhaped leaves; and ſerrated calyxes with the teeth glandular.

The two moſt common ſorts, cultivated among other ſhrubs, are the *ſtinking ſhrubby* [a]

[x] Hypericum quadrangulum *Lin.* Curtis Lond. IV. 52. Fl. dan. 640. Ger. 542. Park. 575.

[y] Hypericum humifuſum *Lin.* Curtis, Lond. III. 50. Fl. dan. 141. Ger. 541. 4.

[z] Hypericum pulchrum *Lin.* Curtis, Lond. I. 56. Fl. dan. 75. Petiv. 60. 6.

[a] Hypericum hircinum *Lin.*

and *Canary*[b] *St. John's worts.* They have both a rank ſmell, reſembling that of a goat, which however, in ſome circumſtances, and at certain diſtances, ſeems to be ſweet, at leaſt to ſome perſons; both alſo have three piſtils: but the firſt is a much lower plant, and has the ſtamens longer than the corolla; whereas in the ſecond they are ſhorter. *Garden Tutſan*[c] is evidently of this genus: it is one of thoſe which have five piſtils; the ſtems are low, ſimple, herbaceous, and quadrangular; the leaves ſmooth, and quite entire: the roots creep extremely, and the flowers are very large. *Wild Tutſan*, or *Tutſan Saint John's wort*[d], called alſo *Park-leaves*, has a ſhrubby, two-edged ſtem; three piſtils, and a berried fruit, or ſoft, coloured pericarp: the flowers of this are ſmall, and the ſtamens extend beyond the corollas. It grows wild in woods, and ſometimes in moiſt hedges. Of the more rare and tender ſorts, the *Majorca Saint John's wort*[e] is very diſtinguiſhable by the warts all over the ſlender red branches; the leaves alſo are *repand* or waved on their edges, have ſmall protuberances on their under ſurface, and at the

[b] Hypericum canarienſe *Lin.* Comm. hort. 2. t. 68.
[c] Hypericum Aſcyron *Lin.* Gmel. ſibir. 4. t. 69. Pl. 24.
[d] Hypericum Androſæmum. *Lin.* Curtis, Lond. III. 48. Ger. 543. 1.
[e] Hypericum balearicum *Lin.* Mill. fig. pl. 54. Curt. Mag. 137.

baſe

baſe embrace the ſtalk: the flowers are large, with the ſtamens a little ſhorter than the corolla, and five piſtils. Laſtly, *Chineſe Hypericum*[f], which ſtands alone, as having one piſtil only, has a ſhrubby ſtem, coloured calyxes, ſtamens longer than the corolla, and is one of the moſt beautiful of this genus, ſo gay with its yellow corollas, and abundant crop of ſtamens.

With this large harveſt, I leave you, dear couſin, till I ſhall have found leiſure to prepare the extenſive and moſt difficult tribe of compound flowers for your inſpection.

[f] Hypericum monogynum *Lin.* Mill. fig. pl. 151. f. 2.

LETTER XXVI.

THE CLASS SYNGENESIA.

Auguſt the 24th, 1776.

THOUGH this letter, dear couſin, will arrive late in the ſeaſon, yet it will be in time for you to examine the far greater part of the claſs *Syngeneſia*, or tribe of compound flowers, which blow chiefly in the autumn. You are well aware that the eſſential character of this claſs is the union of the anthers. You are perfect miſtreſs of the ſtructure of a compound flower, and of the different florets that compoſe it[g]. And laſtly, the ſeveral orders into which the claſs is divided are familiar to you, and the foundation of them well underſtood[h]. Very little therefore remains to premiſe, before we proceed to the examination of the genera and ſpecies.

This is by much the moſt numerous of the natural claſſes[i]; and therefore it ſhould, in all probability, be more difficult to find ſufficient generic and ſpecific diſtinctions here than in any other: ſuch however

[g] See letter VI.
[h] See letter X.
[i] The number of genera being 116, and of ſpecies 1247.

has

...een the ſagacity and induſtry of Lin..., that I hope you will not find any ... difficulty, even in the two firſt orders, ...ich contain above two thirds of all the genera.

THE ORDER POLYGAMIA ÆQUALIS.

To facilitate the inveſtigation, in the firſt order, *Polygamia Æqualis*, it is ſubdivided into three battalions, eaſily diſtinguiſhed by the moſt obvious characters. The firſt contains the flowers compoſed wholly of ligulate florets, which are the Semifloſculous flowers of Tournefort: the ſecond contains the *capitate* or headed flowers: and the third the *diſcoid* flowers. So that there are no radiate flowers in this order: the flowers of the firſt ſection are wholly made up of ſuch florets as compoſe the ray of theſe: in the two other ſections there are none of theſe ligulate corollas or ſemiflorets, but the compound flower is wholly made up of tubulous corollas, or florets properly ſo called: in the ſecond ſection theſe are long, and the calyx bulges out at bottom, as in the thiſtles; in the third, the flowers reſemble a Daiſy or other radiate flower, with the ray pulled off.

The calyx, the receptacle, and the crown of the ſeed will in general be found ſufficient to

to furniſh the generic diſtinctions in t
order[k].

Tragopogon. Thus *Tragopogon* or *Goat's-beard* is kno
by its ſimple calyx, naked receptacle, a
feathered ſtipitate down: and theſe thr
circumſtances are ſufficient to diſtingui
this genus from all others; provided y
have firſt aſſured yourſelf, by the rules
ready laid down, that your flower is of t
compound tribe, that each floſcule has t
anthers united into a cylinder, which t
piſtil, terminated by two revolute ſtigma
perforates; and that the corollas are all l
gulate: for thus it is that you come at th
claſs, order, and ſection. I cannot ſuppo
that you have any difficulty in diſtinguiſhi
a natural compound flower from a doub
one, the creature of art and culture, thoug
the ſimilarity may miſlead thoſe who are n

[k] The calyx is ſingle, or ſimple in *Seriola*, *Gero*
gon, *Andryala*, *Tragopogon*: calycled, or furniſhed wi
a ſecond ſet of leaflets at the baſe, in *Cichorium*, *Picri*
Crepis, *Chondrilla*, *Prenanthes*, *Lapſana*, *Hyoſeris*; in th
reſt imbricate. The receptacle is villous in *Scolymu*
Cithoreum, *Catananche*, *Seriola*, *Hypochæris*, *Geropogon*
in the reſt it is naked, that is, has neither hairs n
chaffs between the floſcules. *Scolymus* and *Lapſan*
have no *pappus* or down: in *Seriola*, *Andryala*, *Crepi*
Prenanthes, *Lactuca*, *Hieracium*, *Sonchus*, the down
ſimple; in *Hypochæris*, *Geropogon*, *Tragopogon*, *Picri*
Leontodon, *Scorzonera*, *Chondrilla*, it is feathered; i
Cichoreum the crown of the ſeed is five-toothed, in *Ca*
tananche five-awned, in *Hyoſeris* crowned with a caly
cle. In ſome genera this down ſits cloſe to the ſeed, i
others it is *ſtiped* or *ſtipitate*: that is, has a ſtem inter
poſed between it and the ſeed.

accuſtome

ccuſtomed to obſervation; becauſe I am ertain that if you have the leaſt doubt, you ill pull out a floſcule, in order to ſee whether it has a ſeed, ſtamens, and piſtil, or is only a mere flat petal. But to return to our plant.—*Yellow* or *Common Goat's-beard*[l], which grows wild among the graſs in meadows, is diſtinguiſhed by entire upright eaves, and by the ſegments of the calyx at eaſt equalling in length the outer floſcules. Towards noon you will not eaſily find this lant, becauſe the flowers are then always loſed: after the flower is paſt, *Goat's-beard* s very apparent, on account of the large lobe formed by the down of the ſeeds, till he wind has at length torn them from the eceptacle, and wafted them ſeparately to iſtant places.

Salſafy[m], which your gardener will furſh you with from the kitchen garden, has he ſegments of the calyx much longer than the floſcules, and the peduncles ſwell out remarkably under the flower; which is large, and of a fine blue.

Another plant of this tribe which you may alſo have from the kitchen garden, is the *Scorzonera*, of a genus nearly allied to the laſt; agreeing with it in having a naked receptacle and a feathered ſtipitate down, Scorzonera.

[l] Tragopogon pratenſe *Lin.* Mor. hiſt. ſ. 7. t. 9. f. 1. Ger. 735. 2.

[m] Tragopogon porrifolium *Lin.* Mor. t. 9. f. 5. Ger. 735. Fl. dan. 797. Pl. 25. f. 1.

but

but differing from it by an imbricate calyx with the ſcales membranaceous about the edge. The cultivated ſpecies[n] has a branching ſtem, and entire, ſtem-claſping leaves, ſlightly ſawed on their edges; the flowers are of a bright yellow.

Sonchus, & Lactuca.

Sowthiſtle and *Lettuce* agree in a naked receptacle, an imbricate calyx, and a ſimple down to the ſeed. But in the firſt the calyx is gibbous, or ſwelling at the baſe; in the ſecond it is cylindric, with membranous edges: the firſt has a ſeſſile down; in the ſecond it is ſtipitate, and the ſeeds are poliſhed. You will always find it uſeful, where you can, thus to bring together and compare plants of nearly allied genera, in order to conſider well their ſimilitudes and differences, and to give you a readineſs in making thoſe minute but important diſtinctions, ſo neceſſary to diſcrimination in natural tribes, wherein all ſeems alike to the untutored eye, as the ſheep of the flock to the ordinary paſſenger; whereas the ſhepherd knows each by its proper marks, and calls them all by their names.

Of the *Sowthiſtle*[o], that vulgar weed of the kitchen garden, there are many varieties; the rough and the ſmooth; with lacerate leaves and ſimple ones, &c. which I

[n] Scorzonera hiſpanica *Lin.* Blackw. 406.

[o] Sonchus oleraceus *Lin.* Curtis, Lond. II. 58. Ger. 292.

mention

mention only that you may not be led to ſearch for them as diſtinct ſpecies; in reality theſe differences are owing merely to accident and ſituation.

Hieracium or *Hawkweed* is a numerous genus of this order and ſection; the calyx is ovate and imbricate, the receptacle naked, and the down ſimple and ſeſſile. There are many ſpecies wild in this country; one[p], which is a large plant, on walls and banks and in woods, with a branching ſtem, the radical leaves oval and toothed, and a ſmaller leaf on the ſtalk: and another very common indeed in dry paſtures, called *Mouſe-ear Hawk-weed*[q], from the long hairs upon the leaves, which are ovate, and abſolutely entire; this ſort throws out runners, and the flowers come out ſingly on naked ſtalks. There are other ſpecies, vulgarly called *Hawkweeds*, which range under other genera, as the *Crepis*, which differs from *Hieracium*, in having the calyx only calycled, with deciduous ſcales. Hieracium.

I ſhall conclude the firſt ſection with *Succory* or *Endive*; which has the calyx calycled, a few chaffs between the floſcules on the receptacle, and the crown of the ſeed moſtly five-toothed and obſcurely hairy. *Wild Suc-* Cichoreum.

[p] Hieracium murorum *Lin.* Mor. hiſt. ſ. 7. t. 5. f. 54. Ger. 304.

[q] Hieracium Piloſella *Lin.* Curtis, Lond. IV. 54. Ger. 638. 2. Park. 690. 1, 2.

cory