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Zea.

three-fided, but the upper one flat: the flak is generally branching.

Mays. otherwife called Indian or Turkey Corn', is of the fame tribe. The ftamineous flowers are borne in loofe fpikes: their calvx is a two-flowered awnlefs glume; neither has the corolla any awn. The other flowers, which have one piftil only. are in very clofe fpikes, below the former, and are inclosed with leaves. The glume both of calvx and corolla is bivalved : the ftyle is filiform, very long, and pendulous: one feed follows each flower: the receptacle is oblong and hollowed, fo that the feeds are immerfed half way into it, forming a very denfe fpike. The Weft Indian Mays has a stalk ten or twelve feet high; long, broad leaves; and fpikes from nine inches to a foot in length, formed of goldcoloured grains. That which is cultivated in Italy, Spain, and Portugal, has more flender stalks, not more than fix or feven feet high; the leaves narrower; the fpikes thorter and more flender, with white grains. The North American Mays, which is the fame with what is cultivated in Germany, does not rife more than four feet in height; the leaves are still shorter and narrower; the fpikes not more than four or five inches long, with yellow and white grains mixed: the colour of these however varies; and

¹ Zea Mays Lin. Blackw. 547.

indeed

MONOECIA.

indeed the three diffinctions are but varieties arifing from foil and climate.

Carex, or Sedge, is a most numerous genus Carex. of the fame order, and the fame natural tribe. The flowers of both forts are borne on an ament or catkin, and each flower has a one-leafed calyx, and no corolla: the • piftilliferous flowers, which are generally in diffinct aments below the others, have an inflated, three-toothed nectary, three ftigmas, and a three-fided feed inclofed within the nectary. Some few species have only one fpike; many have feveral fpikes, with both forts of flowers in each; but more have the staminiferous and pistilliferous flowers in diffinct spikes. These plants grow chiefly in marshes, bogs, ditches, wet woods, and the banks of brooks and rivers; they are the grafs and fodder of fenny countries, and low fwampy grounds k.

In this clafs, Monæcia, as well as in the next, you will find many trees. In the order Tetrandria—Birch, Alder, Box, Mulberry; in that of Polyandria—Oak, Cork, Evergreen Oak, Walnut, Hickery, Chefnut, Beech, Hornbeam, Hazel, Plane; and laftly in that of Monadelphia—all the

^k Carex pendula Curtis III. 63, riparia IV. 60, acuta 61, gracilis 62.—dioica Fl. dan. 369, capitata 372, arenaria 425, muricata 284, remota 370, canefcens 285, limofa 646, capillaris 168, panicea 443, vefacaria 647, hirta 379.—pauciflora Lightf. 6. 2, incurva 24, 1.—Many of the fpecies are figured in Leers's excellent Flora Herbornenfis.

Ff

fpecies of Fir and Pine, Cedar, Larch, Arbor Vitæ, Cyprefs.

Alder is one of the fame genus with . Birch: their common character is, that the flowers of both forts grow in aments or catkins, each feparate from the other; that the calvx is one-leafed and trifid; that each calyx in the ftaminiferous ament includes three flowers, that have four-parted corollas: in the piftilliferous aments there are. only two flowers in each calyx, without any corolla; but these are followed by feeds winged with a membrane on both fides, whereas the others drop from the tree, without leaving any mark behind them. In examining thefe, and the flowers in general of this and the following clafs, I must once for all inform you, that fince many of them are close fet together in the fame ament, you must carefully feparate one. flower from the reft, to avoid confusion. You must also look for them very early in the fpring, fince most of the forest and timber trees flower before the leaf-buds expand.

Common Birch¹ has ovate leaves, drawn to a very narrow point at the end, and ferrated, or fharply toothed round the edge. Linnæus diftinguishes the Alder^m by its

¹ Betula alba Lin. Blackw. t. 240. Duham. t. 39. Ger. 1478. Evelyn's filva by Hunter, p. 218.

^m Betula Alnus Lin. Duham. t. 15. Ger. 1477. 2. Evelyn's filva by Hunter, p. 233.

branching

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Betula,

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branching peduncles: the feeds alfo are borne on a roundifh *ftrobile*, rather than an ament; and the leaves are roundifh, crenate or obtainely notched round the edge; they are of a dark green, with very prominent nerves underneath, and little fpungy fubftances where they divide: the bark of the Alder is black, whereas that of Birch is white.

In Box both forts of flowers come forth Buxus. together in bunches, from the axils of the leaves or branches, and fit clofe to the ftem: the flaminiferous flowers have a three-leaved calyx, with two petals to the corolla, and the rudiment of a germ; the piftilliferous flowers have a four-leaved calyx, three petals to the corolla, three ftyles, and a three-celled capfule, terminated by three beaks, and having two feeds in each cell. Properly fpeaking, there is only one fpecies of box ", varying a little in the fhape of the leaves, and much in the fize.

Mulberry bears the ftaminiferous flowers Morus, in an ament; the others in a feparate roundifh head, which afterwards becomes a compound berry, with one feed in each protuberance; the first have a four-parted calyx; in the pistilliferous ones it is four-leaved, and these have two styles; neither have any corolla. White Mulberry°, which is

ⁿ Buxus fempervirens *Lin.* Blackw. 196. Ger. 1410. ^o Morus alba *Lin.*

Ff 2

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the fort commonly cultivated in France and Italy for feeding filk-worms, has fmooth leaves, obliquely heart-fhaped, and white fruit. Black Mulberry P has rugged, heartfhaped leaves: though cuitivated for the fruit, yet the leaves are preferred to those of the other for feeding filk-worms, and are used for that purpose in Persia, from whence this tree originally came into the fouth of Europe. White Mulberry is a native of China. Of another species 9, paper is made in Japan, from the bark; this has palmate leaves, and hispid fruit. Fuftick wood ' is also from a species of Mulberry: this has axillary thorns, and the leaves are oblong and more extended on one fide than the other. This grows in the iflands of the Weft Indies, but in greateft plenty at Campeachy: the wood is imported into Europe from both places for the ufe of the dyers, but the tree is too tender to fupport our climate.

uercus.

In the order *Polyandria* the Oak leads the way. The ftaminiferous flowers hang on a loofe ament or catkin, whilft the piftilliferous ones are feffile in a bud: the calyx of the former is mostly quinquefid, and the ftamens are from five to ten in number: in the latter the calyx is one-

P Morus nigra Lin.

9 Morus papyrifera Lin. Seba muf. 1. t. 28. f. 3. Kæmpf. amæn. t. 472.

Morus tinctoria Lin. Sloan. jam. 2. t. 158. f. 1. leafed

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Age de and quite entire, and there is one ftyle, fplit into five parts; but fometimes only into two, three or four. The fruit, or acorn, is well known: it is an oval nut, covered with a tough fhell, and immerfed at bottom into the calyx or cup.

We have two principal forts, or perhaps rather varieties in England: one with the leaves on longer petioles, and the acorns feffile, or on very fhort peduncles; the other, having the leaves not fo deeply, but more regularly finuate, the finufes being oppofite; they have fearcely any petioles: on the contrary the acorns grow on very iong peduncles, are larger, and come out fewer together. There are fome other variations in this noble tree, which being lefs confiderable, do not attract our notice as botanifts. Several fpecies different from ours are found in North America; and fome in the fouthern countries of Europe.

Ilex or Evergreen Oak t has oblong-ovate leaves, of a lucid green above, but hoary underneath, ftanding on long petioles, and continuing all the year; they vary much, fome being quite entire, long and narrow; others broad, with the edges toothed and

[•] Linnæus makes them one, under the title of *Quercus Robur*, and defcribes the fpecies as having deciduous leaves, of an oblong form, but broader towards the upper part; the finufes acute, and the angles obtule. Duham. t. 46.—48. Evelyn's filva by Hunter, p. 67. Ger. 1339.

^t Quercus Ilex Lin.

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fet with prickles, almost like those of Holly: the acorns are of the fame fhape with those of the Oak, but fmaller. The. grain-bearing Ilex ", which yields the kermes or scarlet grain, has owate leaves toothe on the edge, and the indentures armed with prickles as in the Holly; they are fmooth on both fides: this is of fo fmall a growth, that it may be looked upon rather as a fhrub than a tree. The Cork-tree v is a fort of Ilex, with a fungous bark full of clefts or chinks, which is the principal as well as most obvious difference: in the air, and form of the leaves, it much refembles the Evergreen Oak: the leaves however fall off in May, before the young ones come out, fo that the Cork trees are bare for a fhort time; which is not the cafe with the common Ilex. Most of the trees in this genus are much reforted to by infects, many of which form different forts of galls : but here we are ftepping out of our province:-we will return to it again, by taking the Walnut under confideration.

Juglans.

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This genus has the flaminiferous flowers thick fet in oblong, cylindric catkins, under the lower leaves of the branches; they confift of fcales with one flower to each; the corolla is fix-parted and the flamens are ufually eighteen, but vary in number from twelve to twenty-four. The piftilliferous

⁴ Quercus coccifera Lin.

V Quercus Suber Lin. Blackw. 193.

flowers

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the vers come out close to the branches, above the others, at the bafe of a petiole, 'generalie in pairs: thefe have a quadrifid calyx, crowning the germ; a four-parted h corolla; and two ftyles: the fruit is a drupe containing a nut, with a furrowed fhell, within which is a four-lobed, irregularly ' furrowed nucleus. Common Walnut " is diftinguished by having the component leaves oval, finooth, fometimes a little toothed, and almost equal: there are many varieties in the fruit, and feveral diffinct fpecies in North America, one of which is the Hickery x. All the fpecies have pinnate leaves, with a different number of leaflets; ours has from five to nine, and the odd leaflet is rather the largeft. Hickery has feven lance-fhaped leaflets, toothed on the edge, and the odd one feffile.

Linnæus joins the *Chefnut* and *Beech* in Fagus. one genus, with this character: that the ftaminiferous flowers, which are in catkins, have a quinquefid, bell-fhaped calyx, and about twelve ftamens: that the piftilliferous flowers, which are produced from buds on the fame tree, have a four-toothed calyx, three ftyles, and a muricate, fourvalved capfule, which before was the calyx, and contains two nuts. He obferves that the ftaminiferous flowers in the chefnut are

* Juglans regia Lin. Mill, illustr. Hunt. Evel. filva, p. 164.

* Juglans alba Lin. Catefb. car. 1. 38.

1 1

difpofed

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difpofed on a cylindric ament, whereas The cat: those of the Beech are in a ball. kins indeed of the former are very long, and the knots of flowers have rear ten in. each, and are diftant from each other: the ftamens are from five to eighteen, and have fhort filaments: the piftilliferous flowers are at the bafe of thefe, and are fucceeded ' by two or three fruits close together; their calyx has more frequently fix fegments than four; the fruit varies in the number of kernels and piftils, but the most common number is fix; and the kernels are convex on one fide and flat on the other. The catkins of the Beech are roundifh and loofe, with few flowers; the flamens are eight in number, on long filaments: and there are only two piftilliferous flowers together, and each of these is fucceeded by a roundish nut, containing three or four hard threefided kernels, which are commonly called Beech maft. The fpecific difference which Linnæus affigns to the Chefnuty and the Beech^z, is taken from the leaves; which in the first are lance-shaped, fawed with the teeth ending in points, and naked or fmooth on the under furface; in the fecond, ovate and obscurely toothed, or rather waving on the edge.

⁹ Fagus Caftanea *Lin.* Mill. fig. pl. 84. Evel. filva by Hunter, p. 153. Ger. 1442.

* Fagus fylvatica Lin. Evel. filva by Hunter, p. 131.

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In the Hornbeam both forts of flowers Carpinus. are difpoled in catkins: both have a calyx confifting of one ciliate or fringed fcale, and the corolla: the one has from eight to fourtion or fixteen flamens; the other has two trms, with two ftyles to each, and at the lafe of each fcale of the ament or *flrobile* lies a feed, which is an ovate nut. In the common Hornbeam^a the fcales of the *flrobiles* are flat; and in the Hop-Hornbeam^b they are inflated: fuch is the fpecific difference of thefe, which are the only known fpecies. The leaves are wrinkled, marked with firong nerves, of an ovate form, and fharply toothed about the edge,

Hazel has the ftaminiferous flowers on a Corylus. Iong cylindric catkin, with one flower to each fcale, which is trifid; it has from fix to ten ftamens; generally eight: the piftilliferous flowers are remote from the others, feffile and inclofed in a bud; the calyx is two-leaved and torn: each flower has two very long, red ftyles; but you muft obferve that there are feveral flowers in the fame bud, which you muft therefore feparate for examination: the fruit, as you know, is an ovate nut. As ufual, neither of the flowers have any corolla. The common Hazel nut and Filbert^c are fuppofed

^a Carpinus Betulus *Lin.* Evel. by Hunter, p. 158. Duh. t. 49. Ger. 1479.

^b Carpinus Oftrya *Lin.* Mich. gen. t. 104. f. 1, 2, ^c Corylus Avellana *Lin.* Blackw. 293. Evel. filva by Hunter, p. 213. Duham. t. 77. Ger. 1438. 44I

not to be fpecifically different, and the p cies is characterized by the ftipules, whic are ovate, and end obtufely; whiereas those of the *Byzantine* or *Spanifbr nut*^d, whic Linnæus gives as a diffinct fpecies, are near, and end acutely. There do not rive at the dignity of trees, but are on fhrubs.

Platanus.

The last tree I shall point out to you of this order is the *Plane*; which has the flowers of both forts in globular aments the staminiferous flowers have a few very fmall fcales for the calyxes, a corolla fcarcel apparent, and anthers furrounding the file ment: the piftilliferous flowers have man very fmall fcales to the calyx; many petal to the corolla; fubulate ftyles with re curved ftigmas; and roundifh feeds, terminated by a pointed ftyle, and having a fim ple down adhering to their bafe. The two fpecies of this tree, for there are no more are well diffinguished by their leaves, which in the Eastern or Asiatic Plane^e are palmate and in the Occidental or Virginian^f, lobate The first was introduced early to Rome and was the favourite tree of the Roman at their villas. All these trees are included in a natural tribe, called Amentacea by Linnæus, and Juliferæ by Haller and others

^d Corylus Colurna Lin. Seba muf. 1. t. 27. f. 2.

• Platanus orientalis Lin. Ger. 1489. Park. 1427 • Platanus occidentalis Lin. Catefby car. 1. t. 56 Duham. arb. t. 25. Park. theat. 1421.

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their name, and what has been already faid in delivering the characters of the genera.

There renains fill a fet of kindred trees, Pinus. the order *Monadelphia*, and of a natural libe, entitled *Coniferæ* or *Cone-bearing*. Of hefe the Pine genus is chief: its generic characters are, that the ftaminiferous flowers are difpofed in racemes, having each of them a four-leaved calyx; no corolla, but abundance of ftamens terminated by naked anthers: the piftilliferous flowers are on a cone; each fcale or calyx has two flowers, without any corolla; one piftil; and a nut furnifhed with a membranous wing.

The whole genus may be divided into the Pines, having two or more leaves from the fame fheathing bafe, and the Firs, having the leaves quite diffinct at the bafe. Of the first division, the most known among us is the Scotch Pine^s, or, as it is vulgarly called, Scotch Fir: this has two leaves in a fheath; and the primordial ones folitary and fmooth. It is by no means peculiar to Scotland, but is found all through Denmark, Norway, and Sweden, in Switzerland, and most other parts of Europe, and even in the Weft Indies. The Pineaster or wild Pine of Italy, the fouth of France and Switzerland, refembles this, but the branches are wider diftant, and more hori-

⁸ Pinus fylvestris Lin. Mill. illustr. Evel. fylva by Hunter, p. 274. Ger. 1356, 1.

zontal;

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zontal; the leaves are larger, thick are ad longer, grow ftraight, are of a darker green and end obtufely; the cones are feven or eight inches long: the leaves of the Scote Pine are broader, grayifh and twifted; th cones fmall, and of a light colour: timber alfo is far preferable, yielding the beft red or yellow deal. Linnæus, how ever, does not feem to have diffinguished them. The Stone Pine h has alfo double leaves, and the primordial ones folitary, but fringed; they are of a glaucous bue: the cones are thick, roundifh, and end obtufely; the scales are flat, and the nuts fo large, that in the fouth of France and Itary they think it worth while to break them, and ferve the kernels up in deferts. Frankincense Pine has three leaves coming out of the fame fheath, and cones as large as those of the Stone Pine, but more pointed, and with loofer fcales, that open horizontally, and drop the feeds. The Cembra Pine k has five leaves in a Theath; they are fmooth, of a light green, long, and narrow; the cones are about three inches long, with close fcales, and large feeds eafily broken. Weymouth Pine 1 has also five leaves in every

^b Pinus Pinea Lin. Blackw. 189. Duham. arb. 2. 27.

ⁱ Pinus Tæda Lin.

^k Pinus Cembra Lin. Gmel. fib. 1. t. 39. Duham. 2. t. 32.

¹ Pinus Strobus Lin. Hunt. Evel. filva, p. 276.

fheath,

he the song and flender, but rugged on he edge; this tree grows remarkably raight and tall, and the bark is very ooth. In North America it is called the Pine, and is excellent for mafts. The less of all these are linear and permanent; Innæus calls this fort of leaf acerofe.

Linnæus includes the Cedar of Lebanon^m and Larch " in this' genus; others feparate them, becaufe the leaves are fafciculate, or come out in clufters, fpreading at top like a painter's brush: this circumstance Linnæus gives for the specific diffinction, adding, that in the former they are acute, and in fire latter obtufe at the end; this is the only difference he mentions; the leaves of the Larch however are deciduous, those of the Cedar permanent or evergreen: the character also of these two trees is totally different-the latter fpreading its vaft arms horizontally till the ends hang down with their own weight, and having a fastigiate or flat top-the former having the branches decreasing from the bottom upwards, and being therefore nearly pyramidal.

Of the Firs properly to called, the Pitchtree, or Norway Fir°, and the Spruce^P, are

^m Pinus Cedrus Lin. Trew. Ehr. t. 1. Edw. av. t. 188.

ⁿ Pinus Larix *Lin.* Hort. angl. 11. Hunt. Evel. filva, p. 280.

• Pinus Picea Lin. Ger. 1363. Hunt. Evel. filva, p. 278.

Pinus Abies Lin, Ger. 1354. Hunt. Ev. filva,
 p. 278.

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the most common. The first has the emarginate, or notched at the end: this is the tree from whence pitch if commonly extracted, and the wood offit is what fe call white deal. The fpruce has awl-fhap pointed, fmooth leaves, turned two dife. rent ways; the timber of this refembles the other, and, when cut into boards, is called by the fame name. Silver Fir is fo named from the whitenefs of the leaves underneath; they are emarginate, and in fhape much refemble those of the Yew : a great deal of turpentine is made from this. Balm of Gilead Fir 9 has the leaves fubemarginate, or but little notched at the end; they are dotted in a double line underneath. There are many varieties, efpecially of the Spruce; but it would lead us too far to notice them.

Cupreffus.

A46

I shall finish this knot of trees with the upright, the funereal Cypress, which has its staminiferous flowers collected into an ovate ament, with one-flowered scales, and four fessile anthers without filaments to each flower: the pistilliferous flowers are in a roundish cone, eight or ten in number, one to each scale; these have many truncated points, hollow at the top, which are perhaps the styles; under the scales of the cone lies an angled nut. Common upright Cypress has imbricate leaves, with the leasing

Pinus Balsamea Lin. Pluk. alm. 2. t. 121. f. I.

* Cupreffus fempervirens Lin. Blackw. 127.

branches quadrangular: this takes naturally a clofe pyramidal form, and when large has the fineft effect imaginable near buildings. Spreading Cyprefs is only a variety of this, but grows to a very large fize, and furnifies the wood fo famous for its durability, and refiftance to infects. Deciduous Cyprefs has the leaves in two ranks, and fpreading: it is a native of America, and grows to a vaft fize. But it is time to deficend from trees to herbs, and thus put an end to this long letter.

The *flinging Nettles*^t are to be found in Unica. the order *Tetrandria* of this clafs; but fuch vulgar ill-humoured plants may forgive your paffing them by, where you have fo many interefting and even great perfonages to attract your notice.

The immortal Amaranth however, hav-Amaraning fuperior elegance and beauty to boaft, thus. will not thus be paffed unnoticed. It is of the order Pentandria, and having no corolla, is ranged by fome in the natural tribe of apetalous flowers. The fame raceme or bunch bears incomplete flowers of both kinds, each of them having a three or fiveleaved calyx; the one bearing three or fiveflamens, the other three ftyles, and a one-

* Cupressus disticha Lin. Cat. car. 1. t. 11.

^t Urtica *Lin.*—pilulifera Mill. illuft. Ger. 707. I. Park. 440. I.—urens Fl. dan. 730. Ger. 707. Park. 440. 2.—dioica Fl. dan. 746. Ger. 706. 2. Park. 441. 3.

celled

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celled capfule opening horizontally, with one feed only lodged in it. The fpecies are numerous: one of the most known is the Amaranthus tricolor, cultivated for the beauty of its leaves, which are variegated with green, yellow, and red: this is one of those that have three stamens to the flowers, which grow in roundifh heads, are axillary, and furround the ftem; the leaves are broad lance-fhaped. Amaranthus bicolor " has only two colours in the leaves, an obfcure purple and bright crimfon : this refembles the other, but has lance-fhaped pointed leaves. Prince's Feather v has five ftamens to the flowers, which are produced in decompounded, cylindric, long, pendulous racemes, of a bright purple, and two feet or more in length. Tree Amaranth refembles this, but is feven or eight feet high: the racemes are thicker, but not for long. Bloody Amaranth w has alfo five ftamens: the racemes are compound and erect, the fide ones very fpreading; the leaves are ovate-oblong: this has purple falks and leaves; the racemes are flort, and at the end of the ftem there is a large clufter of them placed croffwife, with one upright in the middle: the flowers are bright purple at first, but grow darker. Thus I have

" Amaranthus melancholicus Lin.

* Amaranthus caudatus Lin.

"Amaranthus fanguineus Lin. Mill. fig. 22.cruentus Mart. cent. t. 6. felected

felected the most specious of this fine genus for your examination: your gardener will furnish you with them from the hot-beds, when he raises his annual flowers.

. From the order *Polyandria* I fhall pre-Sagittafent you with two wild herbs—Arrow-^{ria.} *bead* and Burnet. The first has many ftaminiferous flowers, and a few with pissils immediately below them: both have a threeleaved calyx, and a corolla of three petals: the one has about twenty-four stamens; the other many germs in a head, ending in very flort styles, terminated by acute permanent stigmas. Our common Arrow-bead^{*} is easily distinguissed by its leaves schaped like the head of an arrow, and pointed: it grows in the water, has rounded white petals with purple claws, and bears an evident affinity to Water-plantain.

Burnet has incomplete flowers of both Poterium forts in the fame fpike; thofe with ftamens below the others: they have a four-leaved calyx, and a four-parted corolla: the lower ones have from thirty to forty ftamens; the upper, two piftils, and a kind of berry formed from the tube of the corolla hardened. Common or fmaller Burnet^y is diftinguished from the other species by being unarmed or having no thorns; and the ftems

* Sagittaria fagittifolia Lin. Fl. dan. 172. Ger. 416. 2. Park. 1247. 2.

^y Poterium fanguiforba Lin. Curtis, Lond. II. 64. Ger. 1045. 1. Park. 582. 1.

being rather angular. This and the Great Burnet², though feparated fo widely in the artificial fystem, are evidently of the fame natural genus: the calvx of the latter is two-leaved, and the number of stamens only four, and one piftil; both in the fame. flower: it is also a much larger plant, with ! not fo many pairs of leaflets: this grows in moift meadows: the other in dry, especially chalky pastures.

Ricinus.

450

Ricinus, or Palma Christi, ranges in the order Monadelphia. The flowers have no corolla: fome are furnished with many ftamens, and there have a five-parted calyx; others have three bifid ftyles, with a threecelled capfule, containing one feed in each cell; in these the calyx is three-parted. Common Palma Christi * has peltate, palmate leaves, toothed about the edge, of a glaucous hue underneath, and glands on the petioles. In the Weft Indies there are feveral others, varying from this, and from each other; which are not, however, generally fupposed to be diffinct species. They call them Agnus castus, or Oil-tree, and extract from them an oil for their lamps; this is the Caftor Oil, used in medicine. The common fort grows in Sicily, and the other warm parts of Europe.

The order Syngenefia of this clafs contains

² Sanguiforba officinalis Lin. Fl. dan. 97. Mor. hift. 1. 8. t. 18. f. 7. Ger. 1045. • Ricinus communis Lin. Mill. fig. 219.

a let

a fet of plants that belong evidently to the fame natural tribe, entitled *Cucurbitaceæ*, or *Gourd plants*. They all agree in a oneleafed calyx, divided into five fegments; a fuperior, monopetalous corolla, divided alfo ufually into five; three filaments; one ftyle, generally trifid: and a *pomum* for a fruit.

Momordica is diffinguished principally by Momorthe elastic burfting of the fruit, which in dica. the common fort is hispid; the stalks of this have no tendrils. From the property of throwing out the seeds with the juice, this plant has acquired the name of Spirting Cucumber^b.

Gourd has the feeds of the fruit with a Cucurtumid margin. Long Gourd^e has the leaves ^{bita.} flightly angular, downy, two-glanded underneath at the bafe; the flowers white, on long peduncles, and reflex at the brim; the fruit crooked, yellow when ripe, and the rind hard and woody, fo that it will contain liquids; whence it is called *Bottle Gourd*.

Pompion, corruptly called Pumpkin^d, is of this genus, and has lobate leaves, with fmooth fruit, which will grow to the fize of a peck.

The Squash , which is another species,

^b Momordica Elaterium Lin. Pl. 31. of this work.

- ^c Cucurbita lagenaria Lin. Mor. hift, f. 1, t. 5. f. 3.
- ^d Cucurbita Pepo Lin.

e Cucurbita Melopepo Lin.

Gg 2

has

has also lobate leaves, erect ftems, and the fruit flatted and knotty.

Warted Gourd^f has likewife lobate leaves'. and knobby fruit, covered with warts. These differ much in their form and fize.

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Cucumis. But the most known and cultivated of these fruits are the Melon and Cucumber. which belong to another genus, called Cucumis, having the feeds of the fruit fharp. Melon^g has the angles of the leaves rounded, and the fruit covered with little fwellings : it varies much, as you know, in the form of the fruit. Cucumber h has the angles of the leaves fharp, and the fruit oblong and rugged i. All thefe having large flowers, with the parts very diftinct, are proper to give you a just idea of this class; with these then I will finish, and release you for the prefent.

- f Cucurbita verrucofa Lin.
- Cucumis Melo Ein. Blackw. 329.
- h Cucumis fatiyus Lin. Blackw. 4.

This ruggedness is frequently loft by culture,

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THE CLASS DIOECIA.

June the ift, 1777.

THE twenty-fecond clafs differs no otherwife from the preceding than in the difposition of the incomplete flowers, namely on different individuals of the fame species; this is its effential character, and this gave occasion to its name—Diæcia. There being no difficulty then in underftanding this, which indeed has been repeated feveral times before, let us go on without farther preface to the examination of fuch plants as are most likely to fall in our way^k.

Such is the *Willow*, which is of the fe-salix. cond order—*Diandria*. Both ftaminiferous and piftilliferous flowers are produced in aments or catkins, on different trees; fo that you will have double trouble in examining the flowers of this clafs; for when you have found one fort, you will have to look about, and perhaps have fome difficulty in finding the other. In fo delightful a fludy however, you will not grudge a

^k The genera in this class are fifty-five, and the fpecies two hundred and nineteen.

Gg3

little

little pains, after having already taken fo much. The flowers of Willow have no corolla, and their calyx is nothing but the fcales of the ament; there is a little honied gland in the centre of each ftaminiferous flower: you will eafily know the other aments, by the ovate germ in each little flower, gradually leffening to a pair of ftyles, fcarcely diffinguishable from it, but by the two erect, bifid ftigmas, with which they are terminated; this germ becomes a onecelled, two-valved capfule, containing many fmall feeds, crowned with a rough fimple down. There are anomalies in this genus; for one fpecies has one, another has three, a third has five flamens, and a fourth has complete flowers. From more than thirty fpecies I shall felect the White Willow 1, which is a tree fo common in watery fituations: you will know it by the lancefhaped, acuminate leaves, toothed about the edges, pubefcent, or villous, on both furfaces, and having the lower ferratures glandulous: the leaves are very white under-. neath; and the catkins are fhort and thick : it will grow to be a large tree, when it is not headed. Several fpecies are commonly cultivated in Ofier-holts m, but being al-

¹ Salix alba Lin. Blackw. t. 327. Ger. 1389. 1. ^m Salix vitellina, amygdalina, purpurea, viminalis, &c. Lin.—Of thefe, S. purpurea is figured in Curtis Lond. n. 61. under the name of S. Monandra. For §. Triandra, fee n. 62.

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ways kept down, in order to have a conftant fucceffion of long, flender twigs, you will have little opportunity of examining their fructification. But one fpecies being cultivated for its beauty, which fortunately depends upon the natural growth, you may ftudy it at your leifure: this is the Weeping Willow ", known at first fight by its long, flender, pendulous branches; the leaves are fmooth, narrow, and linear, tending to lance-fhaped. Common Sallow o has ovate leaves, wrinkled on the furface, which is villous above, and tomentofe or nappy un. derneath, and flightly toothed or waved on the edges. There are feveral varieties of this vulgar fpecies.

Miffeltoe is of the order Tetrandria, its vifcum. parafitic quality you are well acquainted with, and that alone makes it generally obvious to every body: it is however no part of its character. The genus is determined by a four-parted calyx, and an anther growing to each part, without a filament, in the ftaminiferous flowers; a fourleaved calyx fitting on the germ; no ftyle; and a berry inclofing one heart-fhaped feed in the others; neither have any corolla. Common or White Miffeltoe^P is diffinguifhed from the reft of the ipecies by lance-fhaped

ⁿ Salix babylonica Lin.

 Salix caprea Lin. Fl. dan. 245. Ger. 1390. 3.
 Vifcum album Lin. Mill. illuftr. Duham. t. 104, Ger. 1350. 1. Park. 1393. 1.
 G g 4. leaves leaves ending obtufely, a dichotomous ftalk, and axillary fpikes of flowers.

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In the next order Pentandria, we have Spinacia. Spinach, Hemp, and Hop. The first has a five-parted calyx in the ftaminiferous flowers, and a quadrifid or four-cleft one in the others; these have four-cleft ftyles, and one feed within the indurated calvx. Linnæus feparates the garden " fort from the Siberian", by the feeds being feffile, which in the latter are peduncled: of the former are feveral varieties: two remarkable ones, which perhaps may be diffinct, the one having fagittate leaves, and prickly feeds; the other rather ovate leaves, with fmooth feeds.

Cannabis. Hemp' has a five-parted calyx in the flowers which bear ftamens, but in the piftilliferous ones it is one-leafed, entire, and gaping on the fide: thefe have two ftyles, and the feed is a bivalvular nut within the clofed calyx. There is only one known fpecies, and therefore until others are difcovered, there is no occasion for any specific diffinction.

Humulus. Hop t has a five-leaved calyx in the staminiferous flowers; in the others it is one-leafed, obliquely expanding, and en-

9 Spinacia oleracea Lin.

¹ Spinacia fera Lin. Gmel. fib. 3. t. 16.

* Cannabis fativa Lin. Mill. fig. pl. 77. Pl. 32.

Humulus Lupulus Lin. Mill, illustr. Ger. 885. Park. 177.

tire; these have two ftyles, and one feed within a leafy calyx: many of them are collected together to form what we call the Hop. In the three last genera the flowers have no corolla.

The order *Hexandria* has the *Tamus* or *Tamus*. black Bryony, the flowers of which have a fix-parted calyx and no corolla; the piftilliferous flowers have a trifid ftyle, and a three-celled berry below the flower, containing two feeds: our common fpecies " has heart-fhaped undivided leaves.

The Poplars are in the order Octandria. Populus. The flowers of both forts are here borne on fimilar aments, confifting of fcales torn on the edge, and each having one flower, without any petals, but a top-fhaped nectary ending obliquely above in an ovate border; the piftilliferous flowers have a quadrifid ftigma, and are fucceeded by a two-celled capfule, containing many downy feeds. White Poplar * has roundifh leaves indented on the edges into angles, and downy underneath. Great White Poplar, or Abele-tree, is a variety of this, with larger leaves, more divided, and of a darker green. Trembling Poplar, or Afp^{w} , has leaves like the former

^u Tamus communis *Lin.* Mill. illuftr. Mor. hift. f. 1. t. 1. f. 6. Ger. 871. Park. 178. 6.

^v Populus alba *Lin.* Evel. filva by Hunter, p. 201. Duham. t. 36. Ger. 1486. 1. Park. 1410. 1.

** Populus tremula Lin. Blackw. 248. 2. Ger. 1487. 3. Park. 1411. 4.

in

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in fhape, but fmooth on both fides; thefe being fet on long petioles that are flatted at the tip, tremble with the flighteft breeze. Black Poplar * has rhomboid leaves, pointed and toothed; they are fmooth on both fides, of a light green; and the catkins are fhorter than those of the two former. Carolina Poplar y has very large heart-fhaped leaves, obtufely notched about the edges; and the fhoots angled. Tacamabaca² is a fpecies of Poplar, with oblong ovate leaves, toothed about the edges, white underneath, with a fcarcely visible down, and the veins forming a fine net-work ; the ftipules are remarkably refinous.

rialis.

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Mercu- Of the order Enneandria there is an herb. frequent under hedges and in woods, called Dog's Mercury *: the flowers have a threeparted calyx, and no corolla; in fome there are nine or twelve ftamens, with globular, twin anthers; in others, on a diffinct plant, two ftyles, and a two-grained, two-celled capfule, containing one feed in each cell. The fpecies here meant is diffinguished

> * Populus nigra Lin. Mill. illustr. Blackw. 548. & 248. I. Ger. 1486. 2.

> y Populus balfamifera Miller. angulata. Duham. arb. 2. t. 39. f. 9.

> Populus balfamifera Lin. Cat. car. 1, 34. Duh. arb. 2. t. 38. f. 6. Mill. fig. t. 261.

> Mercurialis perennis Lin. Curtis, Lond. H. 65. Ger. 333. 1. M. annua, Curt. Lond. V. 68. Ger. 332. 1, 2.

> > from

from the reft by its very fimple unbranched ftem, and its rough leaves.

In the order Monadelphia you will find a Junigenus of trees under the title of Juniper, perust including not only the Juniper properly fo called, which is rather a fhrub than a tree, but alfo the Savin, and American or Sweet Cedars, &c. ' The staminiferous flowers in this genus are borne on an ament, the fcales of which form the calvx of each flower, having no corolla, but only three ftamens: the piftilliferous flowers have a fmall, permanent, three-parted calyx, growing to the germ, which is below the flower; they have a corolla of three petals, three ftyles, and a three-feeded berry, with three tubercles of the unequal calyx on the lower part, and three little teeth at top from the remains of the petals, Common Juniper b has three fpreading, pointed leaves, coming out together, that are longer than the berry. Savin^c has opposite, erect, decurrent leaves, with the oppositions boxed into each other along the branches; they are fort and acute: this fhrub fpreads out much horizontally, rifing little in height. There are feveral species of Cedar natives of America. Bermudas Cedar^d is that which is imported for cafing black lead in pencils, was for-

^b Juniperus communis Lin. Mill. illuftr. Duham. t. 127. Ger. 1372. 1. Park. 1029. 1.

⁶ Juniperus Sabina *Lin.* Blackw. 214. ⁴ Juniperus bermudiana *Lin.* Herm. lugdb. t. 347. merly

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merly used for wainfcoting rooms, and not for fhips in the Weft Indies, the worm not attacking this kind of wood. The fpe cific diffinction is from the leaves; th lower ones being threefold, the upper two fold^c, decurrent, fubulate, fpreading, and acute. Our plantations of fhrubs have alfe the *Red Virginia*^f, *Carolina*, and *Barbadoes Cedars*; and there are others which are natives of the fouthern parts of Europe^h.

Taxus.

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The baleful *Yew* is of the fame order the flowers have no corolla, nor, properly fpeaking, any calyx, unlefs we allow the three or four-leaved bud to be fuch: on fome trees they will be found to have many flamens, terminated by peltate, eight-cleft anthers; on others, to have an ovate, pointed germ, ending in an obtufe fligma without any flyle, the germ becoming a kind of berry, or rather fucculent receptacle, with one feed in it, having the top naked: thefe flowers all come out from the axils of the leaves, which are linear, end in a fharp point, and are ranged in a double row clofe together along the mid-rib; the

· Miller fays fourfold and imbricate.

f Juniperus virginiana Lin. Sloan. jam. 2. t. 157. f. 3.

² Juniperus barbadenfis *Lin*, Pluk. alm. 197. '4. Hort. angl. t. I. f. I.

^h Juniperus thurifera, phœnicia, lycina, Oxycedrus Lin.

¹ Taxus baccata Lin. Evel. filva by Hunter, p. 257. Duham, t. 86. Ger. 1370. Park. 1412.

berry

berry is red, and mawkifhly fweet-not poifonous, though the leaves certainly are fo.

I will now finish our examination of this Ruseus. clafs, and clofe this letter, with the fingular genus of Ru/cus, the flowers of which have a fix-leaved calyx, no corolla, but an ovate inflated nectary, perforated at top, in the centre of the flower: the flaminiferous flowers have no filaments, but only three anthers, fitting on the top of the nectary, and united at the bafe, whence this genus is of the order Syngenefia: the piftilliferous flowers have one ftyle, and a germ hid within the nectary, which becomes a globofe, three-celled berry, containing two globofe The common fpecies, which we feeds. call Butcher's Broom, or Knee Holly k, bears its flowers in the middle of the leaves, on their upper furface; thefe are of the shape and fize of myrtle leaves, but fliffer, and end in prickly points; the berries are red, and almost as large as cherries : in another fpecies¹ the flowers are produced on the under furface of the leaves: in a third m they are produced alfo underneath, but are protected by a leaflet, whereas in the other fpecies they are naked: a fourth " flowers

* Ruscus aculeatus Lin. Mill. illustr. Blackw. 155. Duham. t. 59. Ger. 907. Park. 253.

¹ Rufcus Hypophyllum Lin. Col. ecphr. 1. t. 165. f. 1.

^m Ruscus Hypogloffum Lin. Col. t. 165. f. 2. ⁿ Ruscus androgynus Lin. Dill. elth. t. 250. f. 332. from

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from the margin of the leaves : and the Alexandrian Laurel°, which is a species, of Rulcus, from long racemes at the ends of the branches: the flowers of this are complete, and therefore the plant ought not to be found in this clafs, but fince it is evidently of this genus naturally, Linnæus has left it with its own family, choofing rather to violate the laws of his own arbitrary fystem than those of nature. The ftalks of this are flender and pliable; the leaves are rounded at the bafe, but end in acute points; they are fmooth, and of a very lucid green: the flowers are of an herbaceous yellow colour, and are fucceeded by berries like those of our Butcher's broom, but fmaller. With this beautiful evergreen I leave you, dear coufin, till the next letter.

* Ruícus racemofus Lin. Mor. hift. f. 13. t. 5. f. 14.

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THE CLASS POLYGAMIA.

June the 14th, 1777.

HERE are fome perfons, dear couwho think the twenty-third fin, clafs-Polygamia, might have been fpared, and the plants comprised in it P ranged in the other claffes, according to the number, fituation, proportion, &c. of the stamens. But let us take things as we find them, without enquiring too deeply into the merits, of what, after all, is of no great importance. The effence of this clafs confifts in having complete flowers, accompanied by one or both forts of incomplete ones, either on the fame or different individuals. The latter circumftance furnishes the character of the three orders.

The first order of this clafs having the complete and incomplete flowers always on the fame plant, is hence entitled *Monæcia*. You may perhaps remember, that fome of the graffles were faid to be of this order ⁹; here alfo are the *Plantain-tree* and *Banana*^{*}: *Valantia* or *Croffwort*, which you Valaptia.

P Genera 34, species 224.

⁹ See letter XIII.

¹ Musa paradisiaca & sapientum Lin. Trew. Ehr. t. 18-23.

may

may find in hedges and bufhy places, and will evidently perceive to be of a natural tribe ' you have met with before ! there is ufually one complete flower in this genus, accompanied on each fide with an incomplete staminiferous one; the former has the corolla four-parted, four stamens, a bifid ftyle, and one feed; the latter have the corolla trifid in fome species, quadrifid in others; three stamens in some, four in others, and an obfcure piftil; none of the flowers have any calyx: frequently thefe plants produce incomplete flowers only, and therefore no feed; owing, I prefume, to their running fo much at the root. Our wild fpecies t is one of those which have the incomplete flowers quadrifid, and it has two leaves to each peduncle, which fupports about eight flowers, with yellow corollas; there are four leaves to each whorl, and they, with the whole plant, are covered with foft hairs.

Parietaria.

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Pellitory of the Wall has two complete flowers, with one piftilliferous flower between them, within a fix-leaved involucre; they have a four-cleft calyx, no corolla, one ftyle, and one feed: the complete flowers are diffinguished by having four stamens; the other has none. Our common fpe-

* Stellatæ : fee letter XV.

^t Valantia Cruciata Lin. Blackw. t. 76. Mor. hift. f. 9. t. 21. f. 1. Ger. 1123. 1.

cies

POLYGAMIA.

cies " has broad lance-fhaped leaves, dichotomous or forked peduncles, and two-leaved 'calyxes: the piftilliferous flowers are quadrangular and pyramidal.

Airiplex, or Orach, has fuch affinity with Airiplex. Chenopodium or Goo/efoot, that, as Linnæus obferves, if Orache had only complete flowers it would be a Goofefoot; and if this had piftilliferous flowers, it would be an Orache. Most of these are common weeds on dunghills, or on the fea-coast.

Acer, or Maple, is a tree in which you may Acer. examine the character of the clafs and order at your eafe. The flowers are produced in bunches; the lower ones complete, and those which are towards the end staminiferous: they have a quinquefid calyx, a corolla of five petals; the complete flowers have befides all this one piftil, and two or three capfules, joined at the bafe, flat, each terminating in a large, membranaceous wing, and containing one feed. The Great Maple, commonly called Sycomore v, has five-lobed leaves unequally ferrate, and the flowers in large racemes. Common Maple " has lobed leaves, obtufe, and emarginate; generally they are divided half way into three lobes,

^a Parietaria officinalis *Lin.* Curtis, Lond. IV. 63. Fl. dan. 521. Ger. 331. Park. 437.

* Acer Pfeudoplatanus Lin. Evel. filva by Hunter, p. 193. Duham. t. 9. Ger. 1484. I. Park. 1425. I. * Acer campeftre Lin. Ger. 1484. 2. Hunt. Evel. filva, p. 183. and Pl. 33. of this work.

Hh

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the fide ones obtufely femi-bifid, the middle one femi-trifid; the upper leaves rather cut into five lobes: the bunches of flowers are fmaller. This tree grows much in hedges.

Mimofa.

The famous Mimofa or Sensitive belongs to this first order of the class Polygamia. The flowers have a five-toothed calyx, a five-cleft corolla, and five or more ftamens: the complete flowers have also one piftil, and a legume for a feed-veffel. This genus is very numerous, but all the fpecies are not endued with the fenfitive quality. That which is most common in the islands of the Weft Indies, and in our floves x, has the ftems armed with fhort recurved fpines; pinnate leaves composed of four or five pairs of leaflets, whofe bafe joins at a point where they are inferted into the petiole, fpreading upwards like the fingers of the hand; the flowers come out from the axils on fhort peduncles, in fmall globular heads, the corollas are yellow; they are fucceeded by fhort, flat, jointed pods, with two or three orbicular, bordered, compreffed feeds in each. Some fpecies move much more readily than others; fome drop the leaflets only, and others drop the petioles of the whole leaf alfo. The true Egyptian Acacia, and many other Acacias, having the fame characters, are included in this genus: they

* Mimofa pudica Lin. Comm. hort. 1. t. 29.

y Mimofa nilotica Lin.

POLYGAMIA.

are too tender to flower much in our climate.

Three-thorned Acacia z is of another ge-Gleditha nus, and indeed of another order-Diacia: for it has the ftaminiferous flowers in a long, compact, cylindric ament, with fome complete ones generally at the end of it; and, on a diffinct plant, pistilliferous flowers on loofe aments. The complete flowers have a quadrifid calyx, a four-petalled corolla, fix ftamens; one piftil, and a legume: the ftaminiferous flowers have a three-leaved calyx, a corolla of three petals, and fix ftamens: and the piftilliferous flowers have a five-leaved calyx, a fivepetalled corolla, one piftil, and a legume. The common species is diffinguished from the other " by its large thorns, which have generally two fmaller ones, coming out from the fide: they are axillary, and are often produced in clufters at the knots of the ftem : the leaves are pinnate, and have ten pairs of fmall leaflets. In America, its native country, this tree is called Honey Locuft.

The Afh-tree is also of this fecond order: Fraxinus. having on fome trees complete flowers, on other piftilliferous ones, each frequently accompanied by the others; they have either a four-parted calyx or none, a corolla

^a Gleditfia triacanthos Lin. Duham. 1. t. 105. 'Hort. angl. t. 21.

* Gleditfia inermis Lin. Mill. fig. pl. 5.

Hh 2

of four petals or none, and one piftil: the complete flowers have alfo two ftamens, and one lance-fhaped feed. Common A/b^{b} has pinnate leaves, with five pairs of leafletes, flightly ferrate on the edge; the flowers have neither calyx nor corolla, and are produced in loofe bunches from the fides of the branches. Flowering A/b^{c} has the leaflets ferrate; the flowers are furnifhed both with calyx and corolla; and are in large loofe bunches at the ends of the branches. The American or Carolina A/b^{d} , has the leaflets quite entire, and the petioles round.

Ficus.

Of the third order-Triacia, we have the Fig, which though it bears flowers' that are visible, yet conceals them within the fruit, and therefore may lead us well enough to the clafs Cryptogamia. What we call the fruit of the Fig Linnæus names the receptacle, or common calyx of the flowers; he defcribes it as being top-fhaped, flefhy, converging, clofed at the broad end with feveral fcales, and having the infide covered with little flowers, complete and incomplete; fometimes in the fame fruit, and fometimes on different trees : the ftaminiferous flowers have a three-parted calyx, and three ftamens; the piftilliferous flowers have a five-parted calyx, one piftil,

^b Fraxinus excelfior Lin. Evelyn's filva by Hunter,
p. 145. Blackw. 328. Duham. t. 101. Ger. 1472.
^c Fraxinus Ornus Lin. Mill. illuftr. Hort. angl. t. 9.
⁶ Fraxinus americana Lin. Catefb. car. 1.80.

and

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and one roundifh, flatted feed; neither of them have any corolla. Our common or eatable Fig^e is diffinguifhed by its palmate leaves: the different fruits are but varieties arifing from the fame feed. The hiftory and œconomy of this fingular tree, as related by naturalifts and travellers, will be an agreeable relaxation to you amidft our dry botanical difquifitions.

* Ficus Carica Lin. Mill. illustr,

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LETTER XXXI.

OF THE NECTARIUM OR NECTARY.

June the 21ft, 1777.

AVING now gone through all the claffes of confpicuous flowers, we fhould regularly proceed to the laft clafs of the fyftem, in which they are inconfpicuous; but having kept on a ftraight courfe for a long time, we will now turn out of it, and take a view of the different appearances which the nectary puts on, in the feveral genera of plants wherein it is found.

Several of thefe have been curforily mentioned as characters of the genus; and we have even hinted at the general ufe of the nectary ^f: but we fhall now go farther, and fay, that though this part of the flower has not hitherto been obferved in two hundred genera^s, yet that in all probability it exifts in all, if not as a diftinct vifible part, as a gland or pore however, or a fet of glands or pores, exuding that vifcid, fweet juice, fo ufeful fecondarily for the nourifhment of a great variety of infects, and, at the fame time doubtlefs primarily neceffary to the fructification of the plant itfelf. For you

f See letters IV. and XVII. Befides the Graffes

will

NECTARY.

fill obferve in monopetalous tubular corollas, that though they have no visible nectary, yet there is a nectareous juice fe-Creted into their tube h, which is therefore probably provided with glands for this purpofe, too minute to be feen with the naked eye, but which an accurate infpection with glaffes might perhaps detect. Polypetalous flowers with open calyxes, having no tube, or bafin for the reception of the nectareous juice, have in general a body deftined to prepare and contain it, in order that it may be distributed to the furrounding parts of fructification, as it is wanted. In the compound and umbellate tribes of plants indeed no nectaries have been remarked, but then you remember, that the whole flower in both of them is fo fmall, that it is no wonder if a part fo minute as the nectary frequently is in larger flowers fhould efcape our obfervation in thefe: we may prefume however that they abound in nectareous juice, fince we observe that infects are particularly fond of these tribes.' No genus of the class Icofandria has any diffinct nectary; but then the calyx is one-leafed, and forms a commodious bafin for the reception of the nectareous juice, which is frequently verydifcernible in it. The verticillate tribe i alfo is not mentioned by Linnæus as being fur-

^h As particularly in the Honeyfuckle and Aloe.
 ⁱ Didynamia Gymnospermia Lin.

H h 4

nifhed

nifhed with visible nectaries; nor are they perhaps immediately neceffary here, because the corolla is monopetalous, and the monophyllous calyx forms a permanent tubes many genera however of this order have a gland in the bottom of the calyx, furrounding the base of the germ; this is large in the *Bugle*, and fufficiently visible in the *Dead Nettle*.

No appearance of the nectary is more common than this of glands. You have already feen k that they are confiderable in feveral genera of the cruciform tribe; that they have furnished us with generic characters: and that they are even the caufe of . the claffical character itfelf¹. It has been just mentioned that they are found in the verticillate or labiate tribe : and many genera, difperfed in various parts of the fyftem, have this glandular nectary. Thus Plukenetia (1080) m has four glands at the bafe of the filaments, as in the clafs Tetradynamia. Cercis (510) has a style-form gland under the germ. Lathraa (743) and Orobanche (779) have a gland at the bafe of the germ. Caffyta (505) has three glands; Echites (299), and Tabernæmontana (301), have five; Hernandia (1049) has

* Letter XXIII.

¹ See letter II. IV. and V. compared with letter XXIII.

⁹ The figures refer to the number of the genus in Linnæus's genera and fyffema.

fix

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fix or four, furrounding the germ; and Grielum (1235) has a fet of oblong glands, found the germ, uniting into a little crown. Malpighia (572) has two glands at the bottom and on the outfide of each leaf of the calyx: in Banisteria (573) the cafe is the fame, except that one foliole of the calyx has no glands, and therefore the whole number is eight; whereas in the other it is ten. Refeda (608) has a gland arifing from the receptacle between the flamens and the upper petal : and (Croton 1083) has five of them, fixed to the receptacle. Aftronium (1111) has five glands in the difk of the flower. Cucurbita (1091), or the gourd genus, has a fingle, triangular, concave gland in the centre of the flower: and in the Salix (1098), or Willow, the fituation is the fame, but the form of it is cylindric.

Another very ufual form of the nectary is fcales, which are in truth but flatted glands. Monnieria (850), and Vicia (873), or the Vetch genus, have one fcale only, at the bafe of the germ. Cufcuta (170), or Dodder, has four fcales, at the bafe of the ftamens. But many have five fcales: as Parnassian (384); at the base of the filaments in Schrebera (319), Quassian (529), and Melastoma (544); between the ftamens in Irefine (1113); at the base of the germ, in Crassian (392), Cotyledon (578), and Se-

* See Plate 34. f. 3.

dum

dum (579); furrounding the receptacle, in Samvda (543); or at the base of the petals, in Erythoxylon (575), Ranunculus ° (699), Grewia (1026), and Kiggelaria (1128), Amaryllis(406), and Leontice (423), have fix fcales; without the base of the filaments in the first, and inferted into the base of the petals in the second.

Not unfrequently does the nectary appear in the fhape of valves, which are generally five in number; in *Plumbago* (213) placed at the bottom of the corolla, and inclofing the germ; furrounding the germ in *Achyranthes* (288); and covering the receptacle in *Campanula* (218) and *Roella* (219). *Afphodel* (421) has fix of thefe valves, inferted into the bafe of the corolla, and forming a complete arch over the germ; a filament fpringing from each of them ^p.

In Erythronium (414) there are two callous tubercles at the base of each inner petal; in the Laurus (503) genus^q, three tubercles round the germ; and two round glands, on a short stalk, near the base of each filament of the inner rank. In some species of Iris there are three dots^r at the base and on the outside of the corolla; in Tamus (1119) an oblong dot grows to the infide of each division of the calyx; and in another genus, Swertia (321), are ten of

> • Plate 34. f. 4. • See letter XIX.

Plate 34. f. 7.
Puncta.

the

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thefe dots; two at the bafe of each division of the corolla, furrounded with briftles. In the Hyacintb⁵ (427) there are three pores at the top of the germ: and in both the genera of Fritillaria (411), and Uvularia (412), there is an excavation at the bafe of each petal: in the Crown Imperial this is confiderable, and generally exhibits a large drop of nectareous juice^t. Mercurialis (1125)^u has two fubulate acumens or fharp points, one on each fide of the germ; and Vallifneria (1097) has a cu/pis on each petal.

You "remember the beautiful appearance that the nectary made in fome fpecies of *Iris*" as a longitudinal villous line upon the petals: in the *Lily* (410) it is a pipe or tubulous line along the middle of each petal: and in *Frankenia* (445) it is a channel running along the claw.

In fome genera the nectary takes the exact form of petals, and was always confounded with them until Linnæus pointed out the difference: this is the cafe with feveral plants of the first class w, and with *Lecythis* (664) in the thirteenth; in all these it is of one petal only: in *Galanthus* (401), or *Snowdrop*, it confists of three parallel, notch-

⁹ Our wild Hyacinth (H. non fcriptus) has not thefe pores, or at leaft they are not visible to the naked eye.

ed,

^t See Plate 34. f. 6. ^u Letter XXIX.

- * Letter XIV. See Pl. 34. f. 5.
- * Letter XI.

ed, obtufe, petal-like leaflets; forming a cylinder about half the length of the corolla Illicium (611) has feveral awl-fhaped folioled of the fame length with the petals themfelves. Cardiospermum (498) has a fourpetalled nectary inclosing the germ; and in Hartogia (273), Sauvagefia (286), and Helisteres (1025), it is made up of five petals. Andrachne (1095) has five femi-bifid herbaceous folioles, lefs than the petals, and placed between them. All the Graffes, Rice (448), and Mays (1042), agree in having a nectary of two minute, oblong leaflets. Swietenia (521), Melia (527), and Melianthus (795), have a one-leafed nectary,. with a many-toothed mouth in the two firft, and in the last within the lowest division of the calyx, to which it grows. In Musa (1141) alfo, the nectary is one boatshaped leaf, compressed, pointed, and inferted within the bofom of the petal. Ten converging leaflets, inclofing the germ, form the nectary of Zygophyllum (530); each leaflet being fixed to the bafe of each filament. Dalechampia (1081) has a broad nectary, composed of many ovate, flat plates, in feveral rows.

I have mentioned before, that in tubulous corollas the nectareous juice is fecreted into the tube: in many genera there is a horn or fpur at the back of the flower, which anfwers this purpole of a recipient. Several plants have occurred in the courfe

of

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Tour examinations with a nectary of this form; as Tropæolum (466), Larkspur * (681), Aconite y (682), Columbine (684), Antirrhinum (750), Fumitory (849), Violet (1007), Impatiens (1008), and Orchis (1009): to these we may add Pinguicula (30), or Butterwort, Utricularia (31), and Valerian (44). In fome fpecies of Antirrhinum the horn is blunted, and becomes rather a bag; which is alfo its fhape in the Satyrium genus (1010). The genera of this tribe are remarkable for their nectaries; in Ophrys (1011) it hangs down from the corolla, longer than the petals, and is keeled at the back part; in Serapias (1012) it is of the fame length with the petals, ovate, gibbous below, and with an ovate lip; in Limodorum (1013) it is of the fame length with the petals, of one leaf, concave, standing on a pedicle, and within the lowest petal; in Arethusa (1014) it is of one leaf, tubulous at the bottom of the ringent corolla, and connate with it; in Cypripedium (1015), or Ladies-Slipper, as you have feen before², it is very large and inflated; and in Epidendrum (1016) it is tubulous at the bafe, turbinate or top-shaped, with an oblique bifid mouth. Thus you observe that all the genera of this tribe have fingular nectaries; whereas in the three claffes with

> * Plate 34. f. 2. * Letter XXVII. * Value 34. f. 1.

> > conjoined

conjoined filaments fcarcely any are to b found *. The numerous genus of Cares (1046), or Sedge, has an inflated, permanent nectary, contracting above, and toothed at top, where it gapes, but continues to inveft the feed; in Rufcus (1139) also it is inflated and open at top, it is ovate, erect, and of the fame fize with the calyx.

In many genera the nectary takes the form of fome well-known utenfil or other thing. Thus in Staphylæa (374), Tinus (504), Winterana (598), and Urtica (1054), or Nettle, it is Urceolate or Pitcher- [haped. In Narciffus (403), and Pancratium (404), it is Funnel-shaped. In Epimedium (148) it is Cyathiform or Goblet-shaped. In Byttneria (268), Theobroma (900), or Chocolate, Ayenia 1020), and Kleinhovia (1024), it is Bell-shaped. In Ciffampelos (1128) it is Wheel-shaped: and in Epidendrum (1016), Poplar (1123), and Gleditfia (1159), it is turbinate, or fhaped like a boy's top, narrow at bottom, and fpreading out above. The most beautiful of these nectaries is the Crown-[haped: in Diofma this is placed on the germ; in Olax (45), Hamamelis (169), Nerium (297) or Oleander, Periploca (303), Silene (567), and Cherleria (570), it terminates the tube of the corolla: but in the Paffion-flower (1021) it is a triple crown or

^a In Monadelphia and Polyadelphia only one in each; and in Diadelphia three. ^b See Plate 14. f. 2. 8 glory,

glory, the outer one longest, furrounding the style .

In Garidella (571), Nigella (685), and Hellehore^d (702), the nectaries are bilabiate; the first has five, the second has eight, and the third has an uncertain number. Trollius (700) has nine linear, flat, bent bodies, perforated at the base, on the infide; and Isopyrum (701) has five equal, tubulous, short nectaries, with a trilobate mouth, inferted into the receptacle, within the petals.

In Arum (1028) the nectaries refemble the filaments of ftamens, only that they thicken at bottom; they come out in two rows from the middle of the fpadix. In Peganum (601) the filaments themfelves are dilated into nectaries at the bafe. In Fevillea (1118) they confift of five compressed bent threads, placed alternately with the ftamens. In Trichilia (528) the nectary is cylindric, and tubulous, formed out of the ten filaments, fhorter than the petals, and with a five-toothed mouth.

You have observed that many nectaries already mentioned have an intimate connexion with the germ; it is a fituation fo common with this part of the flower, that fome perfons have fulpected the fole or principal use of it to be to fupply and foster the germ. Accordingly there are several other

· See Plate 30.

· Plate 34. f. 8.

genera,

genera, in which it is thus placed. Mirabilis (242), or Marvel of Pera, it is globofe, permanent, and incloses the germ, in Ciffus (147), Celofia (289), Limeum (463), and Phyllanthus (1050), it is a ring furrounding the germ : in Cynanchum (304) it is cylindric; with a five-toothed mouth; in Apocynum (305), Asclepias (306), and Stapelia (307), it is made up of five bodies, which in the fecond and third entirely conceal the famens and piftils, and in the third forms a double ftar: all of them about the germ. In Gualtheria (551) it is made up of ten short, awl-shaped, erect bodies, furrounding the germ, between the ftamens.

It must not be diffembled however, that whatever use these bodies may be of to the germ, when they adhere to it, or are near it; they are frequently found on other parts of the fructification. Many inftances of this have already occurred, and to thefe we may add, that they are found on the petals in Bromelia (395), growing to each of the three, above the bafe; in Berberis (442), or the Barberry, in two roundifh orangecoloured bodies at the bafe of each; in Hermannia (828), each petal having a little membrane, forming all together a cowled tube; in Hydrophyllum (204), and Reaumuria (686), in laminæ or plates growing to them; in Myofurus (394), being five awlfhaped bodies. The nectary is found on the

the calyx in Tropæolum mentioned before, in Monotropa (536), in fome fpecies of Bi/cutella (808), and in Malpighia, mentioned alfo before among those which have glandular nectaries. This part is a globofe gland on the exterior tip of the anthers in the Adenanthera (526), at the base of them in Ambrofinia (1238): and on the filaments in form of glands in Dictamnus (522), in form of scales in Zygophyllum (530), placed horizontally on the real filaments in Commelina (62); and in Plumbago, Campanula, and Roella, mentioned before. And, laftly, the nectaries are not unfrequently placed on the receptacle; as in Lathræa (743), Clutia (1140), Melianthus (795), and some others: but these are so close to the germ, which takes its rife from the fame bafe, that they may very well be fuppofed to be placed there for its ufe.

But what shall we fay when we find the nectary, in the incomplete staminiferous flowers, which have no germ; as in Willow (1098), Astronium (1111), Irefine (1113), Fevillea (1118), Poplar (1123), Rhodiola (1124), Kiggelaria (1128), Ciffampelos (1138), Rufcus (1139), Clutia (1140), and Ophioxylon (1142). In all these cases it certainly cannot be of any immediate use to the germ, which is not only on a diffinct flower but on a different plant: this however being the most important part of the vegetable, fince it is defined by na-I i