THE LOVES OF THE PLANTS.

CANTO I.

DESCEND, ye hovering Sylphs! aerial Quires,
And ſweep with little hands your ſilver lyres;
With fairy footſteps print your graſſy rings,
Ye Gnomes! accordant to the tinkling ſtrings;
While in ſoft notes I tune to oaten reed
Gay hopes, and amorous ſorrows of the mead.—
From giant Oaks, that wave their branches dark,
To the dwarf Moſs, that clings upon their bark,

What

What Beaux and Beauties crowd the gaudy groves,
And woo and win their vegetable Loves.
How Snowdrops cold, and blue-eyed Harebels blend
Their tender tears, as o'er the ſtream they bend;
The loveſick Violet, and the Primroſe pale
Bow their ſweet heads, and whiſper to the gale;
With ſecret ſighs the Virgin Lily droops,
And jealous Cowſlips hang their tawny cups.
How the young Roſe in beauty's damaſk pride
Drinks the warm bluſhes of his baſhful bride;
With honey'd lips enamour'd Woodbines meet,
Claſp with fond arms, and mix their kiſſes ſweet.—

Stay thy ſoft-murmuring waters, gentle Rill;
Huſh, whiſpering Winds, ye ruſtling Leaves, be ſtill;
Reſt, ſilver Butterflies, your quivering wings;
Alight, ye Beetles, from your airy rings;

Vegetable Loves. l. 10. Linneus, the celebrated Swediſh naturaliſt, has demonſtrated, that all flowers contain families of males or females, or both; and on their marriages has conſtructed his invaluable ſyſtem of Botany.

Ye painted Moths, your gold-eyed plumage furl,
Bow your wide horns, your ſpiral trunks uncurl;
Glitter, ye Glow-worms, on your moſſy beds;
Deſcend, ye Spiders, on your lengthen'd threads;
Slide here, ye horned Snails, with varniſh'd ſhells;
Ye Bee-nymphs, liſten in your waxen cells!—

BOTANIC MUSE! who in this latter age
Led by your airy hand the Swediſh ſage,
Bad his keen eye your ſecret haunts explore
On dewy dell, high wood, and winding ſhore;
Say on each leaf how tiny Graces dwell;
How laugh the Pleaſures in a bloſſom's bell;
How inſect Loves ariſe on cobweb wings,
Aim their light ſhafts, and point their little ſtings.

" Firſt the tall CANNA lifts his curled brow
Erect to heaven, and plights his nuptial vow;

Canna. l. 39. Cane, or Indian Reed. One male and one female inhabit each flower. It is brought from between the tropics to our hot-houſes, and bears a beautiful crimſon flower; the ſeeds are uſed as ſhot by the Indians, and are ſtrung for prayer-beads in ſome catholic countries.

The

The virtuous pair, in milder regions born,
Dread the rude blaſt of Autumn's icy morn;
Round the chill fair he folds his crimſon veſt,
And claſps the timorous beauty to his breaſt.

Thy love, CALLITRICHE, *two* Virgins ſhare,
Smit with thy ſtarry eye and radiant hair;—
On the green margin ſits the youth, and laves
His floating train of treſſes in the waves;
Sees his fair features paint the ſtreams that paſs,
And bends for ever o'er the watery glaſs.

Two brother ſwains, of COLLIN's gentle name,
The ſame their features, and their forms the ſame,

Callitriche. l. 45. Fine-Hair, Stargraſs. One male and two females inhabit each flower. The upper leaves grow in form of a ſtar, whence it is called Stellaria Aquatica by Ray and others; its ſtems and leaves float far on the water, and are often ſo matted together, as to bear a perſon walking on them. The male ſometimes lives in a ſeparate flower.

Collinſonia. l. 51. Two males one female. I have lately obſerved a very ſingular circumſtance in this flower; the two males ſtand widely diverging from each other, and the female bends herſelf into contact firſt with one of them, and after ſome time leaves this, and applies herſelf to the other. It is probable one of the anthers may be mature before

With rival love for fair COLLINIA ſigh,
Knit the dark brow, and roll the unſteady eye.
With ſweet concern the pitying beauty mourns,
And ſooths with ſmiles the jealous pair by turns.

Sweet blooms GENISTA in the myrtle ſhade,
And *ten* fond brothers woo the haughty maid.

the other? See note on Glorioſa, and Geniſta. The females in Nigella, devil in the buſh, are very ſmall compared to the males; and bending over in a circle to them, give the flower ſome reſemblance to a regal crown. The female of the epilobium anguſtifolium, roſe bay willow herb, bends down amongſt the males for ſeveral days, and becomes upright again when impregnated.

Geniſta. l. 57. Dyer's broom. Ten males and one female inhabit this flower. The males are generally united at the bottom in two ſets, whence Linneus has named the claſs "two brotherhoods." In the Geniſta, however, they are united in but one ſet. The flowers of this claſs are called papilionaceous, from their reſemblance to a butterfly, as the pea-bloſſom. In the Spartium Scoparium, or common broom, I have lately obſerved a curious circumſtance, the males or ſtamens are in two ſets, one ſet riſing a quarter of an inch above the other; the upper ſet does not arrive at their maturity ſo ſoon as the lower, and the ſtigma, or head of the female, is produced amongſt the upper or immature ſet; but as ſoon as the piſtil grows tall enough to burſt open the keel-leaf, or hood of the flower, it bends itſelf round in an inſtant, like a French horn, and inſerts its head, or ſtigma, amongſt the lower or mature ſet of males. The piſtil, or female, continues to grow in length; and in a few days the ſtigma arrives again amongſt the upper ſet, by the time they become mature. This wonderful contrivance is readily ſeen by opening the keel-leaf of the flowers of broom before they burſt ſpontaneouſly. See note on Collinſonia, Glorioſa, Draba.

Two knights before thy fragrant altar bend,
Adored MELISSA! and *two* ſquires attend.
MEADIA's ſoft chains *five* ſuppliant beaux confeſs,
And hand in hand the laughing belle addreſs;
Alike to all, ſhe bows with wanton air,
Rolls her dark eye, and waves her golden hair.

Meliſſa. l. 60. Balm. In each flower there are four males and one female; two of the males ſtand higher than the other two; whence the name of the claſs "two powers." I have obſerved in the Ballota, and others of this claſs, that the two lower ſtamens, or males become mature before the two higher. After they have ſhed their duſt, they turn themſelves away outwards; and the piſtil, or female, continuing to grow a little taller, is applied to the upper ſtamens. See Glorioſa, and Geniſta.

All the plants of this claſs, which have naked ſeeds, are aromatic. The Marum, and Nepeta are particularly delightful to cats; no other brute animals ſeem pleaſed with any odours but thoſe of their food or prey.

Meadia. l. 61. Dodecatheon, American Cowſlip. Five males and one female. The males, or anthers, touch each other. The uncommon beauty of this flower occaſioned Linneus to give it a name ſignifying the twelve heathen gods; and Dr. Mead to affix his own name to it. The piſtil is much longer than the ſtamens, hence the flower-ſtalks have their elegant bend, that the ſtigma may hang downwards to receive the fecundating duſt of the anthers. And the petals are ſo beautifully turned back to prevent the rain or dew drops from ſliding down and waſhing off this duſt prematurely; and at the ſame time expoſing it to the light and air. As ſoon as the ſeeds are formed, it erects all the flower-ſtalks to prevent them from falling out; and thus loſes the beauty of its figure. Is this a mechanical effect, or does it indicate a vegetable ſtorgé to preſerve its offſpring? See note on Ilex, and Glorioſa.

In the Meadia, the Borago, Cyclamen, Solanum, and many others, the filaments are very ſhort compared with the ſtyle. Hence it became neceſſary, 1ſt. to furniſh the ſtamens with long anthers. 2d. To lengthen and bend the peduncle or flower-ſtalk, that the



Engraved by F. P. Nodder.

Meadia

Woo'd with long care, CURCUMA cold and ſhy 65
Meets her fond huſband with averted eye:
Four beardleſs youths the obdurate beauty move
With ſoft attentions of Platonic love.

flower might hang downwards. 3d. To reflect the petals. 4th. To erect theſe peduncles when the germ was fecundated. We may reaſon upon this by obſerving, that all this apparatus might have been ſpared, if the filaments alone had grown longer; and that thence in theſe flowers that the filaments are the moſt unchangeable parts; and that thence their comparative length, in reſpect to the ſtyle, would afford a moſt permanent mark of their generic character.

Curcuma. l. 65. Turmeric. One male and one female inhabit this flower; but there are beſides four imperfect males, or filaments without anthers upon them, called by Linneus eunuchs. The flax of our country has ten filaments, and but five of them are terminated with anthers; the Portugal flax has ten perfect males, or ſtamens; the Verbena of our country has four males; that of Sweden has but two; the genus Albuca, the Bignonia Catalpa, Gratiola, and hemlock-leaved Geranium have only half their filaments crowned with anthers. In like manner the florets, which form the rays of the flowers of the order fruſtraneous polygamy of the claſs ſyngeneſia, or confederate males, as the ſunflower, are furniſhed with a ſtyle only, and no ſtigma: and are thence barren. There is alſo a ſtyle without a ſtigma in the whole order dicœcia gynandria; the male flowers of which are thence barren. The Opulus is another plant, which contains ſome unprolific flowers. In like manner ſome tribes of inſects have males, females, and neuters among them: as bees, waſps, ants.

There is a curious circumſtance belonging to the claſs of inſects which have two wings, or diptera, analogous to the rudiments of ſtamens above deſcribed; viz. two little knobs are found placed each on a ſtalk or peduncle, generally under a little arched ſcale; which appear to be rudiments of hinder wings; and are called by Linneus, halteres, or poiſers, a term of his introduction. A. T. Bladh. Amæn. Acad. V. 7. Other animals have marks of having in a long proceſs of time undergone changes in ſome parts of their bodies, which may have been effected to accommodate them to new ways of procuring their food. The exiſtence of teats on the breaſts of male animals, and which are gene-

With vain deſires the penſive ALCEA burns,
And, like ſad ELOISA, loves and mourns.
The freckled IRIS owns a fiercer flame,
And *three* unjealous huſbands wed the dame.

rally replete with a thin kind of milk at their nativity, is a wonderful inſtance of this kind. Perhaps all the productions of nature are in their progreſs to greater perfection? an idea countenanced by the modern diſcoveries and deductions concerning the progreſſive formation of the ſolid parts of the terraqueous globe, and conſonant to the dignity of the Creator of all things.

Alcea. l. 69. Flore pleno. Double hollyhock. The double flowers, ſo much admired by the floriſts, are termed by the botaniſt vegetable monſters; in ſome of theſe the petals are multiplied three or four times, but without excluding the ſtamens, hence they produce ſome ſeeds, as Campanula and Stramoneum; but in others the petals become ſo numerous as totally to exclude the ſtamens, or males; as Caltha, Peonia, and Alcea; theſe produce no ſeeds, and are termed eunuchs. Philoſ. Botan. No. 150.

Theſe vegetable monſters are formed in many ways. 1ſt. By the multiplication of the petals and the excluſion of the nectaries, as in larkſpur. 2d. By the multiplication of the nectaries and excluſion of the petals; as in columbine. 3d. In ſome flowers growing in cymes, the wheel-ſhape flowers in the margin are multiplied to the excluſion of the bell-ſhape flowers in the centre; as in gelder-roſe. 4th. By the elongation of the florets in the centre. Inſtances of both theſe are found in daiſy and feverfew; for other kinds of vegetable monſters, ſee Plantago.

The perianth is not changed in double flowers, hence the genus or family may be often diſcovered by the calyx, as in Hepatica, Ranunculus, Alcea. In thoſe flowers, which have many petals, the loweſt ſeries of the petals remains unchanged in reſpect to number; hence the natural number of the petals is eaſily diſcovered. As in poppies, roſes, and Nigella, or devil in a buſh. Phil. Bot. p. 128.

Iris. l. 71. Flower de Luce. Three males, one female. Some of the ſpecies have a beautifully freckled flower; the large ſtigma or head of the female covers the three males, counterfeiting a petal with its diviſions.

CUPRESSUS dark diſdains his duſky bride,
One dome contains them, but *two* beds divide.
The proud OSYRIS flies his angry fair,
Two houſes hold the faſhionable pair.

Cupreſſus. l. 73. Cypreſs. One Houſe. The males live in ſeparate flowers, but on the ſame plant. The males of ſome of theſe plants, which are in ſeparate flowers from the females, have an elaſtic membrane; which diſperſes their duſt to a conſiderable diſtance, when the anthers burſt open. This duſt, on a fine day, may often be ſeen like a cloud hanging round the common nettle. The males and females of all the cone-bearing plants are in ſeparate flowers, either on the ſame or on different plants; they produce reſins, and many of them are ſuppoſed to ſupply the moſt durable timber: what is called Venice-turpentine is obtained from the larch by wounding the bark about two feet from the ground, and catching it as it exſudes; Sandarach is procured from common juniper; and Incenſe from a juniper with yellow fruit. The unperiſhable cheſts, which contain the Egyptian mummies, were of Cypreſs; and the Cedar, with which black-lead pencils are covered, is not liable to be eaten by worms. See Miln's Bot. Dict. art. coniferæ. The gates of St. Peter's church at Rome, which had laſted from the time of Conſtantine to that of Pope Eugene the fourth, that is to ſay eleven hundred years, were of Cypreſs, and had in that time ſuffered no decay. According to Thucydides, the Athenians buried the bodies of their heroes in coffins of Cypreſs, as being not ſubject to decay. A ſimilar durability has alſo been aſcribed to Cedar. Thus Horace,

——— *ſperamus carmina fingi*
Poſſe linenda cedro, & lævi ſervanda cupreſſo.

Oſyris. l. 75. Two houſes. The males and females are on different plants. There are many inſtances on record, where female plants have been impregnated at very great diſtance from their male; the duſt diſcharged from the anthers is very light, ſmall, and copious, ſo that it may ſpread very wide in the atmoſphere, and be carried to the diſtant piſtils, without the ſuppoſition of any particular attraction; theſe plants reſemble ſome inſects, as the ants, and cochineal inſect, of which the males have wings, but not the female.

With

With ſtrange deformity PLANTAGO treads,
A Monſter-birth! and lifts his hundred heads;
Yet with ſoft love a gentle belle he charms,
And claſps the beauty in his hundred arms.
So hapleſs DESDEMONA, fair and young,
Won by OTHELLO's captivating tongue,
Sigh'd o'er each ſtrange and piteous tale, diſtreſs'd,
And ſunk enamour'd on his ſooty breaſt.

Two gentle ſhepherds and their ſiſter-wives
With thee, ANTHOXA! lead ambroſial lives;

Plantago. l. 77. Roſea. Roſe-Plantain. In this vegetable monſter the bractes, or diviſions of the ſpike, become wonderfully enlarged; and are converted into leaves. The chaffy ſcales of the calyx in Xeranthemum, and in a ſpecies of Dianthus, and the glume in ſome alpine graſſes, and the ſcales of the ament in the ſalix roſea, roſe willow, grow into leaves; and produce other kinds of monſters. The double flowers become monſters by the multiplication of their petals or nectaries. See note on Alcea.

Anthoxanthum. l. 83. Vernal graſs. Two males, two females. The other graſſes have three males and two females. The flowers of this graſs give the fragrant ſcent to hay. I am informed it is frequently viviparous, that is, that it bears ſometimes roots or bulbs inſtead of ſeeds, which after a time drop off and ſtrike root into the ground. This circumſtance is ſaid to obtain in many of the alpine graſſes, whoſe ſeeds are perpetually devoured by ſmall birds. The Feſtuca Dumetorum, feſcue graſs of the buſhes, produces bulbs from the ſheaths of its ſtraw. The Allium Magicum, or magical onion, produces

Where the wide heath in purple pride extends,
And ſcatter'd furze its golden luſtre blends,
Cloſed in a green receſs, unenvy'd lot!
The blue ſmoak riſes from their turf-built cot;
Boſom'd in fragrance bluſh their infant train,
Eye the warm ſun, or drink the ſilver rain.

The fair OSMUNDA ſeeks the ſilent dell,
The ivy canopy, and dripping cell;
There hid in ſhades *clandeſtine* rites approves,
Till the green progeny betrays her loves.

onions on its head, inſtead of ſeeds. The Polygonum Viviparum, viviparous biſtort, riſes about a foot high, with a beautiful ſpike of flowers, which are ſucceeded by buds or bulbs, which fall off and take root. There is a buſh frequently ſeen on birch-trees, like a bird's neſt, which ſeems to be a ſimilar attempt of nature, to produce another tree; which falling off might take root in ſpongy ground.

There is an inſtance of this double mode of production in the animal kingdom, which is equally extraordinary: the ſame ſpecies of Aphis is viviparous in ſummer, and oviparous in autumn. A. T. Bladh. Amœn. Acad. V. 7.

Oſmunda, l. 93. This plant grows on moiſt rocks; the parts of its flower or its ſeeds are ſcarce diſcernible; whence Linneus has given the name of clandeſtine marriage to this claſs. The younger plants are of a beautiful vivid green.

With

With charms deſpotic fair CHONDRILLA reigns
O'er the ſoft hearts of *five* fraternal ſwains;
If ſighs the changeful nymph, alike they mourn;
And, if ſhe ſmiles, with rival raptures burn.
So, tun'd in uniſon, Eolian Lyre!
Sounds in ſweet ſymphony thy kindred wire;
Now, gently ſwept by Zephyr's vernal wings,
Sink in ſoft cadences the love-ſick ſtrings;
And now with mingling chords, and voices higher,
Peal the full anthems of the aerial choir.

Chondrilla. l. 97. Of the claſs Confederate Males. The numerous florets, which conſtitute the diſk of the flowers in this claſs, contain in each five males ſurrounding one female, which are connected at top, whence the name of the claſs. An Italian writer, in a diſcourſe on the irritability of flowers, aſſerts, that if the top of the floret be touched, all the filaments which ſupport the cylindrical anther will contract themſelves, and that by thus raiſing or depreſſing the anther the whole of the prolific duſt is collected on the ſtigma. He adds, that if one filament be touched after it is ſeparated from the floret, that it will contract like the muſcular fibres of animal bodies, his experiments were tried on the Centaurea Calcitrapoides, and on artichokes, and globe-thiſtles. Diſcourſe on irritability of plants. Dodſley.

Five

Five ſiſter-nymphs to join Diana's train
With thee, fair LYCHNIS! vow,—but vow in vain;
Beneath one roof reſides the virgin band,
Flies the fond ſwain, and ſcorns his offer'd hand;
But when ſoft hours on breezy pinions move,
And ſmiling May attunes her lute to love,
Each wanton beauty, trick'd in all her grace,
Shakes the bright dew-drops from her bluſhing face;
In gay undreſs diſplays her rival charms,
And calls her wondering lovers to her arms.

When the young Hours amid her tangled hair
Wove the freſh roſe-bud, and the lily fair,

Lychnis. l. 108. Ten males and five females. The flowers which contain the five females, and thoſe which contain the ten males, are found on different plants; and often at a great diſtance from each other. Five of the ten males arrive at their maturity ſome days before the other five, as may be ſeen by opening the corol before it naturally expands itſelf. When the females arrive at their maturity, they riſe above the petals, as if looking abroad for their diſtant huſbands; the ſcarlet ones contribute much to the beauty of our meadows in May and June.

Proud GLORIOSA led *three* choſen ſwains,
The bluſhing captives of her virgin chains.—
——When Time's rude hand a bark of wrinkles ſpread
Round her weak limbs, and ſilver'd o'er her head,
Three other youths her riper years engage,
The flatter'd victims of her wily age.

So, in her wane of beauty, NINON won
With fatal ſmiles her gay unconſcious ſon.—

Glorioſa. l. 119. Superba. Six males, one female. The petals of this beautiful flower with three of the ſtamens, which are firſt mature, ſtand up in apparent diſorder; and the piſtil bends at nearly a right angle to inſert its ſtigma amongſt them. In a few days, as theſe decline, the other three ſtamens bend over, and approach the piſtil. In the Fritillaria Perſica, the ſix ſtamens are of equal lengths, and the anthers lie at a diſtance from the piſtil, and three alternate ones approach firſt; and, when theſe decline, the other three approach: in the Lithrum Salicaria, (which has twelve males and one female) a beautiful red flower, which grows on the banks of rivers, ſix of the males arrive at maturity, and ſurround the female ſome time before the other ſix; when theſe decline, the other ſix riſe up, and ſupply their places. Several other flowers have in ſimilar manner two ſets of ſtamens of different ages, as Adoxa, Lychnis, Saxifraga. See Geniſta. Perhaps a difference in the time of their maturity obtains in all theſe flowers, which have numerous ſtamens. In the Kalmia the ten ſtamens lie round the piſtil like the radii of a wheel; and each anther is concealed in a nich of the corol to protect it from cold and moiſture; theſe anthers riſe ſeparately from their niches, and approach the piſtil for a time, and then recede to their former ſituations.

Claſp'd



Gloriosa Superba.

Engraved by Fredk. P. Nodder.

Claſp'd in his arms ſhe own'd a mother's name,—
" Deſiſt, raſh youth! reſtrain your impious flame,
" Firſt on that bed your infant-form was preſs'd,
" Born by my throes, and nurtured at my breaſt."—
Back as from death he ſprung, with wild amaze
Fierce on the fair he fix'd his ardent gaze;
Dropp'd on one knee, his frantic arms outſpread,
And ſtole a guilty glance toward the bed;
Then breath'd from quivering lips a whiſper'd vow,
And bent on heaven his pale repentant brow;
" Thus, thus!" he cried, and plung'd the furious dart,
And life and love guſh'd mingled from his heart.

The fell SILENE and her ſiſters fair,
Skill'd in deſtruction, ſpread the viſcous ſnare.

Silene. l. 139. Catchfly. Three females and ten males inhabit each flower; the viſcous material, which ſurrounds the ſtalks under the flowers of this plant, and of the Cucubulus Otites, is a curious contrivance to prevent various inſects from plundering the honey, or devouring the ſeed. In the Dionæa Muſcipula there is a ſtill more wonderful contrivance to prevent the depredations of inſects: The leaves are armed with long teeth, like the antennæ of inſects, and lie ſpread upon the ground round the ſtem; and

The harlot-band *ten* lofty bravoes ſcreen,
And frowning guard the magic nets unſeen.—
Haſte, glittering nations, tenants of the air,
Oh, ſteer from hence your viewleſs courſe afar!
If with ſoft words, ſweet bluſhes, nods, and ſmiles,
The *three* dread Syrens lure you to their toils,
Limed by their art in vain you point your ſtings,
In vain the efforts of your whirring wings!—
Go, ſeek your gilded mates and infant hives,
Nor taſte the honey purchas'd with your lives!

are ſo irritable, that when an inſect creeps upon them, they fold up, and cruſh or pierce it to death. The laſt profeſſor Linneus, in his Supplementum Plantarum, gives the following account of the Arum Muſcivorum. The flower has the ſmell of carrion; by which the flies are invited to lay their eggs in the chamber of the flower, but in vain endeavour to eſcape, being prevented by the hairs pointing inwards; and thus periſh in the flower, whence its name of fly-eater. P. 411. in the Dypſacus is another contrivance for this purpoſe, a baſon of water is placed round each joint of the ſtem. In the Droſera is another kind of fly-trap. See Dypſacus and Droſera; the flowers of Siléne and Cucúbalus are cloſed all day, but are open and give an agreeable odour in the night. See Cerea. See additional notes at the end of the poem.

When



Engraved by F.P. Nodder.

Dionæa Muscipula.



Engraved by F.P. Nodder.

Amaryllis formosissima.

When heaven's high vault condenſing clouds deform,
Fair AMARYLLIS flies the incumbent ſtorm,

Amaryllis. l. 152. Formoſiſſima. Moſt beautiful Amaryllis. Six males, one female. Some of the bell-flowers cloſe their apertures at night, or in rainy or cold weather, as the convolvulus, and thus protect their included ſtamens and piſtils. Other bell-flowers hang their apertures downwards, as many of the lilies; in thoſe the piſtil, when at maturity, is longer than the ſtamens; and by this pendant attitude of the bell, when the anthers burſt, their duſt falls on the ſtigma: and theſe are at the ſame time ſheltered as with an umbrella from rain and dews. But, as a free expoſure to the air is neceſſary for their fecundation, the ſtyle and filaments in many of theſe flowers continue to grow longer after the bell is open, and hang down below its rim. In others, as in the martagon, the bell is deeply divided, and the diviſions are reflected upwards, that they may not prevent the acceſs of air, and at the ſame time afford ſome ſhelter from perpendicular rain or dew. Other bell-flowers, as the hemerocallis and amaryllis, have their bells nodding only, as it were, or hanging obliquely toward the horizon; which, as their ſtems are ſlender, turn like a weathercock from the wind; and thus very effectually preſerve their incloſed ſtamens and anthers from the rain and cold. Many of theſe flowers, both before and after their ſeaſon of fecundation, erect their heads perpendicular to the horizon, like the Meadia, which cannot be explained from meer mechaniſm.

The Amaryllis formoſiſſima is a flower of the laſt mentioned kind, and affords an agreeable example of *art* in the vegetable economy. 1. The piſtil is of great length compared with the ſtamens; and this I ſuppoſe to have been the moſt unchangeable part of the flower, as in Meadia, which ſee. 2. To counteract this circumſtance, the piſtil and ſtamens are made to decline downwards, that the prolific duſt might fall from the anthers on the ſtigma. 3. To produce this effect, and to ſecure it when produced, the corol is lacerated, contrary to what occurs in other flowers of this genus, and the loweſt diviſion with the two next loweſt ones are wrapped cloſely over the ſtyle and filaments, binding them forcibly down lower toward the horizon than the uſual inclination of the bell in this genus, and thus conſtitutes a moſt elegant flower. There is another contrivance for this purpoſe in the Hemerocallis flava: the long piſtil often is bent ſomewhat like the capital letter *N*, with deſign to ſhorten it, and thus to bring the ſtigma amongſt the anthers.

Seeks with unſteady ſtep the ſhelter'd vale,
And turns her bluſhing beauties from the gale.—
Six rival youths, with ſoft concern impreſs'd,
Calm all her fears, and charm her cares to reſt.—
So ſhines at eve the ſun-illumin'd fane,
Lifts its bright croſs, and waves its golden vane;
From every breeze the poliſh'd axle turns,
And high in air the dancing meteor burns.

Four of the giant brood with ILEX ſtand,
Each graſps a thouſand arrows in his hand;

Ilex. l. 161. Holly. Four males, four females. Many plants, like many animals, are furniſhed with arms for their protection; theſe are either aculei, prickles, as in roſe and barberry, which are formed from the outer bark of the plant; or ſpinæ, thorns, as in hawthorn, which are an elongation of the wood, and hence more difficult to be torn off than the former; or ſtimuli, ſtings, as in the nettles, which are armed with a venomous fluid for the annoyance of naked animals. The ſhrubs and trees, which have prickles or thorns, are grateful food to many animals, as gooſberry, and gorſe; and would be quickly devoured, if not thus armed; the ſtings ſeem a protection againſt ſome kinds of inſects, as well as the naked mouths of quadrupeds. Many plants loſe their thorns by cultivation, as wild animals loſe their ferocity; and ſome of them their horns. A curious circumſtance attends the large hollies in Needwood-foreſt, they are armed with

A thouſand ſteely points on every ſcale
Form the bright terrors of his briſtly male.—
So arm'd, immortal Moore uncharm'd the ſpell,
And ſlew the wily dragon of the well.—
Sudden with rage their *injur'd* boſoms burn,
Retort the inſult, or the wound return;
Unwrong'd, as gentle as the breeze that ſweeps
The unbending harveſts or undimpled deeps,
They guard, the Kings of Needwood's wide domains,
Their ſiſter-wives and fair infantine trains;
Lead the lone pilgrim through the trackleſs glade,
Or guide in leafy wilds the wand'ring maid.

thorny leaves about eight feet high, and have ſmooth leaves above; as if they were conſcious that horſes and cattle could not reach their upper branches. See note on Meadia, and on Mancinella. The numerous clumps of hollies in Needwood-foreſt ſerve as land-marks to direct the travellers acroſs it in various directions; and as a ſhelter to the deer and cattle in winter; and in ſcarce ſeaſons ſupply them with much food. For when the upper branches, which are without prickles, are cut down, the deer crop the leaves and peel off the bark. The bird-lime made from the bark of hollies ſeems to be a very ſimilar material to the elaſtic gum, or Indian rubber, as it is called. There is a foſſile elaſtic bitumen found at Matlock in Derbyſhire, which much reſembles theſe ſubſtances in its elaſticity and inflammability. The thorns of the mimoſa cornigere reſemble cow's horns in appearance as well as in uſe. Syſtem of Vegetables, p. 782.

So WRIGHT's bold pencil from Veſuvio's hight
Hurls his red lavas to the troubled night;
From Calpè ſtarts the intolerable flaſh,
Skies burſt in flames, and blazing oceans daſh;—
Or bids in ſweet repoſe his ſhades recede,
Winds the ſtill vale, and ſlopes the velvet mead;
On the pale ſtream expiring Zephyrs ſink,
And Moonlight ſleeps upon its hoary brink.

Gigantic Nymph! the fair KLEINHOVIA reigns,
The grace and terror of Orixa's plains;

Hurls his red lavas. l. 176. Alluding to the grand paintings of the eruptions of Veſuvius, and of the deſtruction of the Spaniſh veſſels before Gibraltar; and to the beautiful landſcapes and moonlight ſcenes, by Mr. Wright of Derby.

Kleinhovia. l. 183. In this claſs the males in each flower are ſupported by the female. The name of the claſs may be tranſlated "Viragoes," or "Feminine Males."

The largeſt tree perhaps in the world is of the ſame natural order as Kleinhovia, it is the Adanſonia, or Ethiopian Sour-gourd, or African Calabaſh tree. Mr. Adanſon ſays the diameter of the trunk frequently exceeds 25 feet, and the horizontal branches are from 45 to 55 feet long, and ſo large that each branch is equal to the largeſt trees of Europe. The breadth of the top is from 120 to 150 feet. And one of the roots bared only in part by the waſhing away of the earth by the river, near which it grew, meaſured 110 feet long; and yet theſe ſtupendous trees never exceed 70 feet in height. Voyage to Senegal.

O'er

O'er her warm cheek the bluſh of beauty ſwims,
And nerves Herculean bend her ſinewy limbs;
With frolic eye ſhe views the affrighted throng,
And ſhakes the meadows, as ſhe towers along,
With playful violence diſplays her charms,
And bears her trembling lovers in her arms.
So fair THALESTRIS ſhook her plumy creſt,
And bound in rigid mail her jutting breaſt;
Poiſed her long lance amid the walks of war,
And Beauty thunder'd from Bellona's car;
Greece arm'd in vain, her captive heroes wove
The chains of conqueſt with the wreaths of love.

When o'er the cultured lawns and dreary waſtes
Retiring Autumn flings her howling blaſts,
Bends in tumultuous waves the ſtruggling woods,
And ſhowers their leafy honours on the floods,
In with[illegible]ng heaps collects the flowery ſpoil,
And each chill inſect ſinks beneath the ſoil;

Quick flies fair TULIPA the loud alarms,
And folds her infant cloſer in her arms;
In ſome lone cave, ſecure pavilion, lies,
And waits the courtſhip of ſerener ſkies.—
So, ſix cold moons, the Dormouſe charm'd to reſt,
Indulgent Sleep! beneath thy eider breaſt,
In fields of Fancy climbs the kernel'd groves,
Or ſhares the golden harveſt with his loves.—

Tulipa. l. 205. Tulip. What is in common language called a bulbous root, is by Linneus termed the Hybernacle, or Winter-lodge of the young plant. As theſe bulbs in every reſpect reſemble buds, except in their being produced under ground, and include the leaves and flower in miniature, which are to be expanded in the enſuing ſpring. By cautiouſly cutting in the early ſpring through the concentric coats of a tulip-root, longitudinally from the top to the baſe, and taking them off ſucceſſively, the whole flower of the next ſummer's tulip is beautifully ſeen by the naked eye, with its petals, piſtil, and ſtamens; the flowers exiſt in other bulbs, in the ſame manner, as in Hyacinths, but the individual flowers of theſe being leſs, they are not ſo eaſily diſſected, or ſo conſpicuous to the naked eye.

In the ſeeds of the Nymphæa Nelumbo, the leaves of the plant are ſeen ſo diſtinctly, that Mr. Ferber found out by them to what plant the ſeeds belonged. Amœn. Acad. V. vi. No. 120. He ſays that Mariotte firſt obſerved the future flower and foliage in the bulb of a Tulip; and adds, that it is pleaſant to ſee in the buds of the Hepatica, and Pedicularis hirſuta, yet lying in the earth; and in the gems of Daphne Mezereon; and at the baſe of Oſmunda Lunaria, a perfect plant of the future year compleat in all its parts. Ibid.

But

But bright from earth amid the troubled air
Aſcends fair COLCHICA with radiant hair,
Warms the cold boſom of the hoary year,
And lights with Beauty's blaze the duſky ſphere.
Three bluſhing Maids the intrepid Nymph attend,
And *ſix* gay Youths, enamour'd train! defend.
So ſhines with ſilver guards the Georgian ſtar,
And drives on Night's blue arch his glittering car;
Hangs o'er the billowy clouds his lucid form,
Wades through the miſt, and dances in the ſtorm.

Colchicum autumnale. l. 214. Autumnal Meadow-ſaffron. Six males, three females. The germ is buried within the root, which thus ſeems to conſtitute a part of the flower. Families of Plants. p. 242 Theſe ſingular flowers appear in the autumn without any leaves, whence in ſome countries they are called Naked Ladies: in the March following the green leaves ſpring up, and in April the ſeed-veſſel riſes from the ground; the ſeeds ripen in May, contrary to the uſual habits of vegetables, which flower in the ſpring, and ripen their ſeeds in the autumn. Miller's Dict. The juice of the root of this plant is ſo acrid as to produce violent effects on the human conſtitution, which alſo prevents it from being eaten by ſubterranean inſects, and thus guards the ſeed-veſſel during the winter. The defoliation of deciduous trees is announced by the flowering of the Colchicum; of theſe the aſh is the laſt that puts forth its leaves, and the firſt that loſes them. Phil. Bot. p. 275.

The Hamamelis, Witch Hazle, is another plant which flowers in autumn; when the leaves fall off, the flowers come out in cluſters from the joints of the branches, and in Virginia ripen their ſeed in the enſuing ſpring; but in this country their ſeeds ſeldom ripen. Lin. Spec. Plant. Miller's Dict.

GREAT HELIANTHUS guides o'er twilight plains
In gay ſolemnity his Derviſe-trains;
Marſhall'd in *fives* each gaudy band proceeds,
Each gaudy band a plumed Lady leads;
With zealous ſtep he climbs the upland lawn,
And bows in homage to the riſing dawn;
Imbibes with eagle-eye the golden ray,
And watches, as it moves, the orb of day.

Helianthus. l. 223. Sun flower. The numerous florets, which conſtitute the diſk of this flower, contain in each five males ſurrounding one female, the five ſtamens have their anthers connected at top, whence the name of the claſs "confederate males;" ſee note on Chondrilla. The ſun-flower follows the courſe of the ſun by nutation, not by twiſting its ſtem. (Hales veg. ſtat.) Other plants, when they are confined in a room, turn the ſhining ſurface of their leaves, and bend their whole branches to the light. See Mimoſa.

A plumed Lady leads. l. 226. The ſeeds of many plants of this claſs are furniſhed with a plume, by which admirable mechaniſm they are diſſeminated by the winds far from their parent ſtem, and look like a ſhuttlecock, as they fly. Other ſeeds are diſſeminated by animals; of theſe ſome attach themſelves to their hair or feathers by a gluten, as miſleto; others by hooks, as cleavers, burdock, hounds-tongue; and others are ſwallowed whole for the ſake of the fruit, and voided uninjured, as the hawthorn, juniper, and ſome graſſes. Other ſeeds again diſperſe themſelves by means of an elaſtic ſeed-veſſel, as Oats, Geranium, and Impatiens; and the ſeeds of aquatic plants, and of thoſe which grow on the banks of rivers, are carried many miles by the currents, into which they fall. See Impatiens. Zoſtera. Caſſia. Carlīna.

Queen

Queen of the marſh, imperial DROSERA treads
Ruſh-fringed banks, and moſs-embroider'd beds;
Redundant folds of gloſſy ſilk ſurround
Her ſlender waiſt, and trail upon the ground;
Five ſiſter-nymphs collect with graceful eaſe,
Or ſpread the floating purple to the breeze;
And *five* fair youths with duteous love comply
With each ſoft mandate of her moving eye.
As with ſweet grace her ſnowy neck ſhe bows,
A zone of diamonds trembles round her brows;
Bright ſhines the ſilver halo, as ſhe turns;
And, as ſhe ſteps, the living luſtre burns.

Droſera. l. 231. Sun-dew. Five males, five females. The leaves of this marſh-plant are purple, and have a fringe very unlike other vegetable productions. And, which is curious, at the point of every thread of this erect fringe ſtands a pellucid drop of mucilage, reſembling a ducal coronet. This mucus is a ſecretion from certain glands, and like the viſcous material round the flower-ſtalks of Silene (catchfly) prevents ſmall inſects from infeſting the leaves. As the ear-wax in animals ſeems to be in part deſigned to prevent fleas and other inſects from getting into their ears. See Silene. Mr. Wheatly, an eminent ſurgeon in Cateaton-ſtreet, London, obſerved theſe leaves to bend upwards, when an inſect ſettled on them, like the leaves of the muſcipula veneris, and pointing all their globules of mucus to the centre, that they compleatly intangled and deſtroyed it. M. Brouſſonet, in the Mem. de l'Acad. des Sciences for the year 1784. p. 615. after having deſcribed the motion of the Dionæa, adds, that a ſimilar appearance has been obſerved in the leaves of two ſpecies of Droſera.

Fair

Fair LONICERA prints the dewy lawn,
And decks with brighter bluſh the vermil dawn;
Winds round the ſhadowy rocks, and panſied vales,
And ſcents with ſweeter breath the ſummer-gales;

Lonicera. l. 243. Caprifolium. Honeyſuckle. Five males, one female. Nature has in many flowers uſed a wonderful apparatus to guard the nectary, or honey-gland, from inſects. In the honey-ſuckle the petal terminates in a long tube like a cornucopiæ, or horn of plenty; and the honey is produced at the bottom of it. In Aconitum, monks-hood, the nectaries ſtand upright like two horns covered with a hood, which abounds with ſuch acrid matter that no inſects penetrate it. In Helleborus, hellebore, the many nectaries are placed in a circle, like little pitchers, and add much to the beauty of the flower. In the Columbine, Aquilegia, the nectary is imagined to be like the neck and body of a bird, and the two petals ſtanding upon each ſide to repreſent wings; whence its name of columbine, as if reſembling a neſt of young pigeons fluttering whilſt their parent feeds them. The importance of the nectary in the economy of vegetation is explained at large in the notes on part the firſt.

Many inſects are provided with a long and pliant proboſcis for the purpoſe of acquiring this grateful food, as a variety of bees, moths, and butterflies: but the Sphinx Convolvuli, or unicorn moth, is furniſhed with the moſt remarkable proboſcis in this climate. It carries it rolled up in concentric circles under its chin, and occaſionally extends it to above three inches in length. This trunk conſiſts of joints and muſcles, and ſeems to have more verſatile movements than the trunk of the elephant; and near its termination is ſplit into two capillary tubes. The excellence of this contrivance for robbing the flowers of their honey, keeps this beautiful inſect fat and bulky; though it flies only in the evening, when the flowers have cloſed their petals, and are thence more difficult of acceſs; at the ſame time the brilliant colours of the moth contribute to its ſafety, by making it miſtaken by the late ſleeping birds for the flower it reſts on.

Beſides theſe there is a curious contrivance attending the Ophrys, commonly called the Bee-orchis, and the Fly-orchis, with ſome kinds of the Delphinium, called Bee-larkſpurs, to preſerve their honey; in theſe the nectary and petals reſemble in form and colour the inſects, which plunder them: and thus it may be ſuppoſed, they often eſcape theſe hourly robbers, by having the appearance of being pre-occupied. See note on Rubia, and Conferva polymorpha.

With artleſs grace and native eaſe ſhe charms,
And bears the Horn of Plenty in her arms.
Five rival Swains their tender cares unfold,
And watch with eye aſkance the treaſured gold.

Where rears huge Tenerif his azure creſt,
Aſpiring DRABA builds her eagle neſt;
Her pendant eyry icy caves ſurround,
Where erſt Volcanos min'd the rocky ground.
Pleaſed round the Fair *four* rival Lords aſcend
The ſhaggy ſteeps, *two* menial youths attend.
High in the ſetting ray the beauty ſtands,
And her tall ſhadow waves on diſtant lands.

Draba. l. 252. Alpina. Alpine Whitlow-graſs. One female and ſix males. Four of theſe males ſtand above the other two; whence the name of the claſs "four powers." I have obſerved in ſeveral plants of this claſs, that the two lower males ariſe, in a few days after the opening of the flower, to the ſame height as the other four, not being mature as ſoon as the higher ones. See note on Glorioſa. All the plants of this claſs poſſeſs ſimilar virtues; they are termed acrid and antiſcorbutic in their raw ſtate, as muſtard, watercreſs; when cultivated and boiled, they become a mild wholeſome food, as cabbage, turnep.

There was formerly a Volcano on the Peake of Tenerif, which became extinct about the year 1684. Philoſ. Tranſ. In many excavations of the mountain, much below the ſummit, there is now found abundance of ice at all ſeaſons. Tench's Expedition to Botany Bay, p. 12. Are theſe congelations in conſequence of the daily ſolution of the hoar-froſt which is produced on the ſummit during the night?

Stay,

Stay, bright inhabitant of air, alight,
Ambitious VISCA, from thy eagle-flight!—
——Scorning the ſordid ſoil, aloft ſhe ſprings,
Shakes her white plume, and claps her golden wings;
High o'er the fields of boundleſs ether roves,
And ſeeks amid the clouds her ſoaring loves!

Stretch'd on her moſſy couch, in trackleſs deeps,
Queen of the coral groves, ZOSTERA ſleeps;

Viſcum. l. 260. Miſletoe. Two houſes. This plant never grows upon the ground; the foliage is yellow, and the berries milk-white; the berries are ſo viſcous, as to ſerve for bird-lime; and when they fall, adhere to the branches of the tree, on which the plant grows, and ſtrike root into its bark; or are carried to diſtant trees by birds. The Tillandſia, or wild pine, grows on other trees, like the Miſletoe, but takes little or no nouriſhment from them, having large buckets in its leaves to collect and retain the rain water. See note on Dypſacus. The moſſes, which grow on the bark of trees, take much nouriſhment from them; hence it is obſerved that trees, which are annually cleared from moſs by a bruſh, grow nearly twice as faſt. (Phil. Tranſact.) In the cyder countries the peaſants bruſh their apple-trees annually.

Zoſtera. l. 266. Graſs-wrack. Claſs, Feminine Males. Order, Many Males. It grows at the bottom of the ſea, and riſing to the ſurface, when in flower, covers many leagues; and is driven at length to the ſhore. During its time of floating on the ſea, numberleſs animals live on the under ſurface of it; and being ſpecifically lighter than the ſea water, or being repelled by it, have legs placed as it were on their backs for the purpoſe of walking under it. As the Scyllœa. See Barbut's Genera Vermium. It ſeems neceſſary that the marriages of plants ſhould be celebrated in the open air, either becauſe the powder of the anther, or the mucilage on the ſtigma, or the

The ſilvery ſea-weed matted round her bed,
And diſtant ſurges murmuring o'er her head.—
High in the flood her azure dome aſcends,
The cryſtal arch on cryſtal columns bends;
Roof'd with tranſlucent ſhell the turrets blaze,
And far in ocean dart their colour'd rays;
O'er the white floor ſucceſſive ſhadows move,
As riſe and break the ruffled waves above.—
Around the nymph her mermaid-trains repair,
And weave with orient pearl her radiant hair;
With rapid fins ſhe cleaves the watery way,
Shoots like a ſilver meteor up to day;
Sounds a loud conch, convokes a ſcaly band,
Her ſea-born lovers, and aſcends the ſtrand.

reſervoir of honey might receive injury from the water. Mr. Needham obſerved, that in the ripe duſt of every flower, examined by the microſcope, ſome veſicles are perceived, from which a fluid had eſcaped; and that thoſe, which ſtill retain it, explode if they be wetted, like an eolopile ſuddenly expoſed to a ſtrong heat. Theſe obſervations have been verified by Spallanzani and others. Hence rainy ſeaſons make a ſcarcity of grain, or hinder its fecundity, by burſting the pollen before it arrives at the moiſt ſtigma of the flower. Spallanzani's Diſſertations, v. II. p. 321. Thus the flowers of the male Valliſneria are produced under water, and when ripe detach themſelves from the plant, and riſing to the ſurface are wafted by the air to the female flowers. See Valliſneria.

E'en round the pole the flames of Love aſpire,
And icy boſoms feel the *ſecret* fire!—
Cradled in ſnow and fann'd by arctic air
Shines, gentle BAROMETZ! thy golden hair;
Rooted in earth each cloven hoof deſcends,
And round and round her flexile neck ſhe bends;
Crops the grey coral moſs, and hoary thyme,
Or laps with roſy tongue the melting rime;
Eyes with mute tenderneſs her diſtant dam,
Or ſeems to bleat, a *Vegetable Lamb.*

Barometz. l. 284. Polypodium Barometz. Tartarian Lamb. Clandeſtine Marriage. This ſpecies of Fern is a native of China, with a decumbent root, thick, and every where covered with the moſt ſoft and denſe wool, intenſely yellow. Lin. Spec. Plant.

This curious ſtem is ſometimes puſhed out of the ground in its horizontal ſituation by ſome of the inferior branches of the root, ſo as to give it ſome reſemblance to a Lamb ſtanding on four legs; and has been ſaid to deſtroy all other plants in its vicinity. Sir Hans Sloane deſcribes it under the name of Tartarian Lamb, and has given a print of it. Philoſ. Tranſ. abridged, v. 11. p. 646. but thinks ſome art had been uſed to give it an animal appearance. Dr. Hunter, in his edition of the Terra of Evelyn, has given a more curious print of it, much reſembling a ſheep. The down is uſed in India externally for ſtopping hemorrhages, and is called golden moſs.

The thick downy clothing of ſome vegetables ſeems deſigned to protect them from the injuries of cold, like the wool of animals. Thoſe bodies, which are bad conductors of

—So, warm and buoyant in his oily mail,
Gambols on ſeas of ice the unwieldy Whale;
Wide-waving fins round floating iſlands urge
His bulk gigantic through the troubled ſurge;
With hideous yawn the flying ſhoals He ſeeks,
Or claſps with fringe of horn his maſſy cheeks;
Lifts o'er the toſſing wave his noſtrils bare,
And ſpouts pellucid columns into air;
The ſilvery arches catch the ſetting beams,
And tranſient rainbows tremble o'er the ſtreams.

electricity, are alſo bad conductors of heat, as glaſs, wax, air. Hence either of the two former of theſe may be melted by the flame of a blow-pipe very near the fingers which hold it without burning them; and the laſt, by being confined on the ſurface of animal bodies, in the interſtices of their fur or wool, prevents the eſcape of their natural warmth; to which ſhould be added, that the hairs themſelves are imperfect conductors. The fat or oil of whales, and other northern animals, ſeems deſigned for the ſame purpoſe of preventing the too ſudden eſcape of the heat of the body in cold climates. Snow protects vegetables which are covered by it from cold, both becauſe it is a bad conductor of heat itſelf, and contains much air in its pores. If a piece of camphor be immerſed in a ſnow-ball, except one extremity of it, on ſetting fire to this, as the ſnow melts, the water becomes abſorbed into the ſurrounding ſnow by capillary attraction; on this account, when living animals are buried in ſnow, they are not moiſtened by it; but the cavity enlarges as the ſnow diſſolves, affording them both a dry and warm habitation.

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

Mimoſa. l. 321. The ſenſitive plant. Of the claſs Polygamy, one houſe. Naturaliſts have not explained the immediate cauſe of the collapſing of the ſenſitive plant; the leaves meet and cloſe in the night during the ſleep of the plant, or when expoſed to much cold in the day-time, in the ſame manner as when they are affected by external violence, folding their upper ſurfaces together, and in part over each other like ſcales or tiles; ſo as to expoſe as little of the upper ſurface as may be to the air; but do not indeed collapſe quite ſo far, ſince I have found, when touched in the night during their ſleep, they fall ſtill further; eſpecially when touched on the foot-ſtalks between the ſtems and the leaflets, which ſeems to be their moſt ſenſitive or irritable part. Now as their ſituation after being expoſed to external violence reſemb'es their ſleep, but with a greater degree of collapſe, may it not be owing to a numbneſs or paralyſis conſequent to too violent irritation, like the faintings of animals from pain or fatigue? I kept a ſenſitive plant in a dark room till ſome hours after day-break: its leaves and leaf-ſtalks were collapſed as in its moſt profound ſleep, and on expoſing it to the light, above twenty minutes paſſed before the plant was thoroughly awake and had quite expanded itſelf. During the night the upper or ſmoother ſurfaces of the leaves are appreſſed together; this would ſeem to ſhew that the office of this ſurface of the leaf was to expoſe the fluids of the plant to the light as well as to the air. See note on Helianthus. Many flowers cloſe up their petals during the night. See note on vegetable reſpiration in Part I.

Veil'd,

Veil'd, with gay decency and modeſt pride,
Slow to the moſque ſhe moves, an eaſtern bride;
There her ſoft vows unceaſing love record,
Queen of the bright ſeraglio of her Lord.—
So ſinks or riſes with the changeful hour
The liquid ſilver in its glaſſy tower.
So turns the needle to the pole it loves,
With fine librations quivering as it moves.

All wan and ſhivering in the leafleſs glade
The ſad ANEMONE reclined her head;
Grief on her cheeks had paled the roſeate hue,
And her ſweet eye-lids dropp'd with pearly dew.
—" See, from bright regions, borne on odorous gales
" The Swallow, herald of the ſummer, ſails;

Anemone. l. 318. Many males, many females. Pliny ſays this flower never opens its petals but when the wind blows; whence its name: it has properly no calix, but two or three ſets of petals, three in each ſet, which are folded over the ſtamens and piſtil in a ſingular and beautiful manner, and differs alſo from ranunculus in not having a melliferous pore on the claw of each petal.

The Swallow. l. 322. There is a wonderful conformity between the vegetation of ſome plants, and the arrival of certain birds of paſſage. Linneus obſerves that the wood

" Breathe,

" Breathe, gentle AIR! from cherub-lips impart
" Thy balmy influence to my anguiſh'd heart;
" Thou, whoſe ſoft voice calls forth the tender blooms,
" Whoſe pencil paints them, and whoſe breath perfumes;
" O chaſe the Fiend of Froſt, with leaden mace
" Who ſeals in death-like ſleep my hapleſs race;
" Melt his hard heart, releaſe his iron hand,
" And give my ivory petals to expand.
" So may each bud, that decks the brow of ſpring,
" Shed all its incenſe on thy wafting wing!"—

anemone blows in Sweden on the arrival of the ſwallow; and the marſh mary-gold, Caltha, when the cuckoo ſings. Near the ſame coincidence was obſerved in England by Stillingfleet. The word Coccux in Greek ſignifies both a young fig and a cuckoo, which is ſuppoſed to have ariſen from the coincidence of their appearance in Greece. Perhaps a ſimilar coincidence of appearance in ſome parts of Aſia gave occaſion to the ſtory of the loves of the roſe and nightingale, ſo much celebrated by the eaſtern poets. See Dianthus. The times however of the appearance of vegetables in the ſpring ſeem occaſionally to be influenced by their acquired habits, as well as by their ſenſibility to heat: for the roots of potatoes, onions, &c. will germinate with much leſs heat in the ſpring than in the autumn; as is eaſily obſervable where theſe roots are ſtored for uſe; and hence malt is beſt made in the ſpring. 2d. The grains and roots brought from more ſouthern latitudes germinate here ſooner than thoſe which are brought from more northern ones, owing to their acquired habits. Fordyce on Agriculture. 3d. It was obſerved by one of the ſcholars of Linneus, that the apple-trees ſent from hence to New England bloſſomed for a few years too early for that climate, and bore no fruit; but afterwards learnt to accommodate themſelves to their new ſituation. (Kalm's Travels.) 4th. The parts of animals become more ſenſible to heat after having been previouſly expoſed to

To her fond prayer propitious Zephyr yields,
Sweeps on his ſliding ſhell through azure fields,
O'er her fair manſion waves his whiſpering wand,
And gives her ivory petals to expand;
Gives with new life her filial train to riſe,
And hail with kindling ſmiles the genial ſkies.
So ſhines the Nymph in beauty's bluſhing pride,
When Zephyr wafts her deep calaſh aſide;
Tears with rude kiſs her boſom's gauzy veil,
And flings the fluttering kerchief to the gale.
So bright, the folding canopy undrawn,
Glides the gilt Landau o'er the velvet lawn,

cold, as our hands glow on coming into the houſe after having held ſnow in them; this ſeems to happen to vegetables; for vines in grape-houſes, which have been expoſed to the winter's cold, will become forwarder and more vigorous than thoſe which have been kept during the winter in the houſe. (Kenedy on Gardening.) This accounts for the very rapid vegetation in the northern latitudes after the ſolution of the ſnows.

The increaſe of the irritability of plants in reſpect to heat, after having been previouſly expoſed to cold, is further illuſtrated by an experiment of Dr. Walker's. He cut apertures into a birch-tree at different heights; and on the 26th of March ſome of theſe apertures bled, or oozed with the ſap-juice, when the thermometer was at 39; which ſame apertures did not bleed on the 13th of March, when the thermometer was at 44. The reaſon of this I apprehend was, becauſe on the night of the 25th the thermometer was as low as 34; whereas on the night of the 12th it was at 41; though the ingenious author aſcribes it to another cauſe. Tranſ. of Royal Soc. of Edinburgh, v. 1. p. 19.

Of beaux and belles diſplays the glittering throng;
And ſoft airs fan them, as they roll along.

Where frowning Snowden bends his dizzy brow
O'er Conway, liſtening to the ſurge below;
Retiring LICHEN climbs the topmoſt ſtone,
And 'mid the airy ocean dwells alone.—
Bright ſhine the ſtars unnumber'd *o'er her head*,
And the cold moon-beam gilds her flinty bed;
While round the rifted rocks hoarſe whirlwinds breathe,
And dark with thunder fail the clouds *beneath*.—
The ſteepy path her plighted ſwain purſues,
And tracks her light ſtep o'er th' imprinted dews,
Delighted Hymen gives his torch to blaze,
Winds round the craggs, and lights the mazy ways;

Lichen. l. 349. Calcareum. Liver-wort. Clandeſtine Marriage. This plant is the firſt that vegetates on naked rocks, covering them with a kind of tapeſtry, and draws its nouriſhment perhaps chiefly from the air; after it periſhes, earth enough is left for other moſſes to root themſelves; and after ſome ages a ſoil is produced ſufficient for the growth of more ſucculent and large vegetables. In this manner perhaps the whole earth has been gradually covered with vegetation, after it was raiſed out of the primeval ocean by ſubterraneous fires.

Sheds

Sheds o'er their *ſecret* vows his influence chaſte,
And decks with roſes the admiring waſte.

High in the front of heaven when Sirius glares,
And o'er Britannia ſhakes his fiery hairs;
When no ſoft ſhower deſcends, no dew diſtills,
Her wave-worn channels dry, and mute her rills;
When droops the ſickening herb, the bloſſom fades,
And parch'd earth gapes beneath the withering glades.
——With languid ſtep fair DYPSACA retreats;
" Fall gentle dews!" the fainting nymph repeats;
Seeks the low dell, and in the ſultry ſhade
Invokes in vain the Naiads to her aid.—

Dypſacus. l. 367. Teaſel. One female, and four males. There is a cup around every joint of the ſtem of this plant, which contains from a ſpoonful to half a pint of water; and ſerves both for the nutriment of the plant in dry ſeaſons, and to prevent inſects from creeping up to devour its ſeed. See Silene. The Tillandſia, or wild pine, of the Weſt Indies has every leaf terminated near the ſtalk with a hollow bucket, which contains from half a pint to a quart of water. Dampier's Voyage to Campeachy. Dr. Sloane mentions one kind of aloe furniſhed with leaves, which, like the wild pine and Banana, hold water; and thence afford neceſſary refreſhment to travellers in hot countries. Nepenthes had a bucket for the ſame purpoſe at the end of every leaf. Burm. Zeyl. 42. 17.

Four ſilvan youths in cryſtal goblets bear
The untaſted treaſure to the grateful fair;
Pleaſed from their hands with modeſt grace ſhe ſips,
And the cool wave reflects her coral lips.

With nice ſelection modeſt RUBIA blends, 375
Her vermil dyes, and o'er the cauldron bends;
Warm 'mid the riſing ſteam the Beauty glows,
As bluſhes in a miſt the dewy roſe.

Rubia. l. 375. Madder. Four males and one female. This plant is cultivated in very large quantities for dying red. If mixed with the food of young pigs or chickens, it colours their bones red. If they are fed alternate fortnights with a mixture of madder, and with their uſual food alone, their bones will conſiſt of concentric circles of white and red. Belchier. Phil. Tranſ. 1736. Animals fed with madder for the purpoſe of theſe experiments were found upon diſſection to have thinner gall. Comment. de rebus. Lipſiæ. This circumſtance is worth further attention. The colouring materials of vegetables, like thoſe which ſerve the purpoſe of tanning, varniſhing, and the various medical purpoſes, do not ſeem eſſential to the life of the plant; but ſeem given it as a defence againſt the depredations of inſects or other animals, to whom theſe materials are nauſeous or deleterious. To inſects and many ſmaller animals their colours contribute to conceal them from the larger ones which prey upon them. Caterpillars which feed on leaves are generally green; and earth-worms the colour of the earth which they inhabit; Butterflies, which frequent flowers, are coloured like them; ſmall birds which frequent hedges have greeniſh backs like the leaves, and light coloured bellies like the ſky, and are hence leſs viſible to the hawk, who paſſes under them or over them. Thoſe birds which are much amongſt flowers, as the gold-finch (Fringilla carduelis), are furniſhed with vivid colours. The lark, partridge, hare, are the colour of the dry vegetables or earth on which they reſt. And frogs vary their colour with the mud of the ſtreams which they

With chemic art *four* favour'd youths aloof
Stain the white fleece, or ſtretch the tinted woof;
O'er Age's cheek the warmth of youth diffuſe,
Or deck the pale-eyed nymph in roſeate hues.
So when MEDEA to exulting Greece
From plunder'd COLCHIS bore the golden fleece;
On the loud ſhore a magic pile ſhe rais'd,
The cauldron bubbled, and the faggots blaz'd;—
Pleaſed on the boiling wave old ÆSON ſwims,
And feels new vigour ſtretch his ſwelling limbs;

frequent; and thoſe which live on trees are green. Fiſh, which are generally ſuſpended in water, and ſwallows, which are generally ſuſpended in air, have their backs the colour of the diſtant ground, and their bellies of the ſky. In the colder climates many of theſe become white during the exiſtence of the ſnows. Hence there is apparent deſign in the colours of animals, whilſt thoſe of vegetables ſeem conſequent to the other properties of the materials which poſſeſs them.

Pleaſed on the boiling wave. l. 387. The ſtory of Æſon becoming young, from the medicated bath of Medea, ſeems to have been intended to teach the efficacy of warm bathing in retarding the progreſs of old age. The words *relaxation and bracing*, which are generally thought expreſſive of the effects of warm and cold bathing, are mechanical terms, properly applied to drums or ſtrings; but are only metaphors when applied to the effects of cold or warm bathing on animal bodies. The immediate cauſe of old age ſeems to reſide in the inirritability of the finer veſſels or parts of our ſyſtem; hence theſe ceaſe to act, and collapſe or become horny or bony. The warm bath is peculiarly adapted to prevent theſe circumſtances by its increaſing our irritability, and by moiſten-

Through his thrill'd nerves forgotten ardors dart,
And warmer eddies circle round his heart;
With ſofter fires his kindling eye-balls glow,
And darker treſſes wanton round his brow.

As daſh the waves on India's breezy ſtrand,
Her fluſh'd cheek preſs'd upon her lily hand,
VALLISNER ſits, up-turns her tearful eyes,
Calls her loſt lover, and upbraids the ſkies;

ing and ſoftening the ſkin, and the extremities of the finer veſſels, which terminate in it. To thoſe who are paſt the meridian of life, and have dry ſkins, and begin to be emaciated, the warm bath, for half an hour twice a week, I believe to be eminently ſerviceable in retarding the advances of age.

Valliſneria. l. 395. This extraordinary plant is of the claſs Two Houſes. It is found in the Eaſt Indies, in Norway, and various parts of Italy. Lin. Spec. Plant. They have their roots at the bottom of the Rhone, the flowers of the female plant float on the ſurface of the water, and are furniſhed with an elaſtic ſpiral ſtalk, which extends or contracts as the water riſes and falls; this riſe or fall, from the rapid deſcent of the river, and the mountain torrents which flow into it, often amounts to many feet in a few hours. The flowers of the male plant are produced under water, and as ſoon as their farina, or duſt, is mature; they detach themſelves from the plant, and riſe to the ſurface, continue to flouriſh, and are wafted by the air, or borne by the currents to the female flowers. In this reſembling thoſe tribes of inſects, where the males at certain ſeaſons acquire wings, but not the females, as ants, Cocchus, Lampyris, Phalæna, Brumata, Lichanella. Theſe male flowers are in ſuch numbers, though very minute, as frequently to cover the ſurface of the river to conſiderable extent. See Families of Plants tranſlated from Linneus, p. 677.

For



Vallisneria Spiralis.

Engraved by Fredk. P. Nodder.

For him ſhe breathes the ſilent ſigh, forlorn,
Each ſetting-day; for him each riſing morn.—
" Bright orbs, that light yon high etherial plain,
" Or bathe your radiant treſſes in the main;
" Pale moon, that ſilver'ſt o'er night's ſable brow;—
" For ye were witneſs to his parting vow!—
" Ye ſhelving rocks, dark waves, and ſounding ſhore,—
" Ye echoed ſweet the tender words he ſwore!—
" Can ſtars or ſeas the ſails of love retain?
" O guide my wanderer to my arms again!"—

Her buoyant ſkiff intrepid ULVA guides,
And ſeeks her Lord amid the trackleſs tides;

Ulva. l. 407. Clandeſtine marriage. This kind of ſea-weed is buoyed up by bladders of air, which are formed in the duplicatures of its leaves; and forms immenſe floating fields of vegetation; the young ones, branching out from the larger ones, and borne on ſimilar little air-veſſels. It is alſo found in the warm baths of Patavia; where the leaves are formed into curious cells or labyrinths for the purpoſe of floating on the water. See ulva labyrinthi-formis Lin. Spec. Plant. The air contained in theſe cells was found by Dr. Prieſtley to be ſometimes purer than common air, and ſometimes leſs pure; the air-bladders of fiſh ſeem to be ſimilar organs, and ſerve to render them buoyant in the water. In ſome of theſe, as in the Cod and Haddock, a red membrane, conſiſting of a great number of leaves or duplicatures, is found within the air-bag, which probably

Her *ſecret* vows the Cyprian Queen approves,
And hovering halcyons guard her infant-loves;
Each in his floating cradle round they throng,
And dimpling Ocean bears the fleet along.—
Thus o'er the waves, which gently bend and ſwell,
Fair GALATEA ſteers her ſilver ſhell;

ſecretes this air from the blood of the animal. (Monro. Phyſiol. of Fiſh. p. 28.) To determine whether this air, when firſt ſeparated from the blood of the animal or plant, be dephlogiſticated air, is worthy inquiry. The bladder-ſena (Colutea), and bladder-nut (Staphylæa), have their ſeed-veſſels diſtended with air; the Ketmia has the upper joint of the ſtem immediately under the receptacle of the flower much diſtended with air; theſe ſeem to be analogous to the air-veſſel at the broad end of the egg, and may probably become leſs pure as the ſeed ripens: ſome, which I tried, had the purity of the ſurrounding atmoſphere. The air at the broad end of the egg is probably an organ ſerving the purpoſe of reſpiration to the young chick, ſome of whoſe veſſels are ſpread upon it like a placenta, or permeate it. Many are of opinion that even the placenta of the human fetus, and cotyledons of quadrupeds, are reſpiratory organs rather than nutritious ones.

The air in the hollow ſtems of graſſes, and of ſome umbelliferous plants, bears analogy to the air in the quills, and in ſome of the bones of birds; ſupplying the place of the pith, which ſhrivels up after it has performed its office of protruding the young ſtem or feather. Some of theſe cavities of the bones are ſaid to communicate with the lungs in birds. Phil. Tranſ.

The air-bladders of fiſh are nicely adapted to their intended purpoſe; for though they render them buoyant near the ſurface without the labour of uſing their fins, yet, when they reſt at greater depths, they are no inconvenience, as the increaſed preſſure of the water condenſes the air which they contain into leſs ſpace. Thus, if a cork or bladder of air was immerſed a very great depth in the ocean, it would be ſo much compreſſed, as to become ſpecifically as heavy as the water, and would remain there. It is probable the unfortunate Mr. Day, who was drowned in a diving-ſhip of his own conſtruction, miſcarried from not attending to this circumſtance: it is probable the quantity of air he took down with him, if he deſcended much lower than he expected, was condenſed into ſo ſmall a ſpace as not to render the ſhip buoyant when he endeavoured to aſcend.

Her

Her playful Dolphins ſtretch the ſilken rein,
Hear her ſweet voice, and glide along the main.
As round the wild meandering coaſt ſhe moves
By guſhing rills, rude cliffs, and nodding groves;
Each by her pine the Wood-nymphs wave their locks,
And wondering Naiads peep amid the rocks;
Pleaſed trains of Mermaids riſe from coral cells,
Admiring Tritons ſound their twiſted ſhells;
Charm'd o'er the car purſuing Cupids ſweep,
Their ſnow-white pinions twinkling in the deep;
And, as the luſtre of her eye ſhe turns,
Soft ſighs the Gale, and amorous Ocean burns.

On Dove's green brink the fair Tremella ſtood,
And view'd her playful image in the flood;

Tremella. l. 427. Clandeſtine marriage. I have frequently obſerved funguſſes of this Genus on old rails and on the ground to become a tranſparent jelly, after they had been frozen in autumnal mornings; which is a curious property, and diſtinguiſhes them from ſome other vegetable mucilage; for I have obſerved that the paſte, made by boiling wheat-flour in water, ceaſes to be adheſive after having been frozen. I ſuſpected that the Tremella Noſtoc, or ſtar-jelly, alſo had been thus produced; but have ſince been

To each rude rock, lone dell, and echoing grove
Sung the ſweet ſorrows of her *ſecret* love.
" Oh, ſtay !—return !"—along the ſounding ſhore
Cry'd the ſad Naiads,—ſhe return'd no more !—
Now girt with clouds the ſullen Evening frown'd,
And withering Eurus ſwept along the ground;
The miſty moon withdrew her horned light,
And ſunk with Heſper in the ſkirt of night;

well informed, that the Tremella Noſtoc is a mucilage voided by Herons after they have eaten frogs; hence it has the appearance of having been preſſed through a hole; and limbs of frogs are ſaid ſometimes to be found amongſt it; it is always ſeen upon plains or by the ſides of water, places which Herons generally frequent.

Some of the Funguſſes are ſo acrid, that a drop of their juice bliſters the tongue; others intoxicate thoſe who eat them. The Oſtiacks in Siberia uſe them for the latter purpoſe; one Fungus of the ſpecies, Agaricus muſcarum, eaten raw; or the decoction of three of them, produces intoxication for 12 or 16 hours. Hiſtory of Ruſſia. V. I. Nichols. 1780. As all acrid plants become leſs ſo, if expoſed to a boiling heat, it is probable the common muſhroom may ſometimes diſagree from being not ſufficiently ſtewed. The Oſtiacks bliſter their ſkin by a fungus found on Birch-trees; and uſe the Agaricus officin. for Soap. ib.

There was a diſpute whether the funguſſes ſhould be claſſed in the animal or vegetable department. Their animal taſte in cookery, and their animal ſmell when burnt, together with their tendency to putrefaction, inſomuch that the Phallus impudicus has gained the name of ſtink-horn; and laſtly, their growing and continuing healthy without light, as the Licoperdon tuber or truffle, and the fungus vinoſus or mucor in dark cellars, and the eſculent muſhrooms on beds covered thick with ſtraw, would ſeem to ſhew that they approach towards the animals, or make a kind of iſthmus connecting the two mighty kingdoms of animal and of vegetable nature.

No dim electric ſtreams, (the northern dawn,)
With meek effulgence quiver'd o'er the lawn;
No ſtar benignant ſhot one tranſient ray
To guide or light the wanderer on her way.
Round the dark craggs the murmuring whirlwinds blow,
Woods groan above, and waters roar below;
As o'er the ſteeps with pauſing foot ſhe moves,
The pitying Dryads ſhriek amid their groves;
She flies,—ſhe ſtops,—ſhe pants—ſhe looks behind,
And hears a demon howl in every wind.
—As the bleak blaſt unfurls her fluttering veſt,
Cold beats the ſnow upon her ſhuddering breaſt;
Through her numb'd limbs the chill ſenſations dart,
And the keen ice-bolt trembles at her heart.
"I ſink, I fall! oh, help me, help!" ſhe cries,
Her ſtiffening tongue the unfiniſh'd ſound denies;
Tear after tear adown her cheek ſucceeds,
And pearls of ice beſtrew the glittering meads;
Congealing ſnows her lingering feet ſurround,
Arreſt her flight, and root her to the ground;

With ſuppliant arms ſhe pours the ſilent prayer;
Her ſuppliant arms hang cryſtal in the air;
Pellucid films her ſhivering neck o'erſpread,
Seal her mute lips, and ſilver o'er her head,
Veil her pale boſom, glaze her lifted hands,
And ſhrined in ice the beauteous ſtatue ſtands.
—Dove's azure nymphs on each revolving year
For fair Tremella ſhed the tender tear;
With ruſh-wove crowns in ſad proceſſion move,
And ſound the ſorrowing ſhell to hapleſs love."

Here pauſed the Muse,—acroſs the darken'd pole
Sail the dim clouds, the echoing thunders roll;
The trembling Wood-nymphs, as the tempeſt lowers,
Lead the gay Goddeſs to their inmoſt bowers;
Hang the mute lyre the laurel ſhade beneath,
And round her temples bind the myrtle wreath.
—Now the light ſwallow with her airy brood
Skims the green meadow, and the dimpled flood;

Loud

Loud ſhrieks the lone thruſh from his leafleſs thorn,
Th' alarmed beetle ſounds his bugle horn;
Each pendant ſpider winds with fingers fine
His ravel'd clue, and climbs along the line;
Gay Gnomes in glittering circles ſtand aloof
Beneath a ſpreading muſhroom's fretted roof;
Swift bees returning ſeek their waxen cells,
And Sylphs cling quivering in the lily's bells.
Through the ſtill air deſcend the genials ſhowers,
And pearly rain-drops deck the laughing flowers.