THE LOVES OF THE PLANTS.

CANTO I.

DESCEND, ye hovering Sylphs![1] aerial Quires[2],
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[3]
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 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 vanish'd shells;
Ye Bee-nymphs, listen in your waxen cells!—

B O T A N I C M U S E ! 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 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[4] 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 tall 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[5] 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[6] to give it a name signifying the twelve heathen gods; and Dr. Mead[7] 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[8] 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

[Figure: Meadia Engrav'd by F. P. Nodder.[9]]

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[10] 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 diœcia gynandria; the male flowers of which are thence barren. The Opulus[11] 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.[12] 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 said ELOISA,[13] 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 terraquaeous 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.[14]

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,[15] 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[16] 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.[17]

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 exudes; 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.[18] The gates of St. Peter's church at Rome, which had lasted from the time of Constantine to that of Pope Eugene the fourth,[19] that is to say eleven hundred years, were of Cypress, and had in that time suffered no decay. According to Thucydides,[20] 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.[21]

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 pistil, without the supposition of any particular attraction; these plants resemble some insects, as the ants, and cochineal insect,[22] of which the males have wings, but not the female.

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.[23]

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[24] in some alpine grasses, and the scales of the ament[25] 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. 8[6]. 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[26] 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.[27] A. T. Bladh. Amœn. Acad. V. 7.[28]

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 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![29]
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 of 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 Centauréa Calcitrapoides, and on artichokes, and globe-thistles. Discourse on irritability of plants. Dodsley.[30]

Five sister-nymphs to join Diana's[31] 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[32] won
With fatal smiles her gay unconscious son. —[33]

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 around 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.

[Figure: Gloriosa Superba. Engraved by Fred.k P. Nodder.[34]]

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,[35] 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 endeavor 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.

[Figure: Dionæa Muscipula. Engrav'd by F. P. Nodder.[36]]

[Figure: Amaryllis formosissima. Engrav'd by F. P. Nodder.[37]]

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When heaven's high vault condensing clouds deform,[38]

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 forceibly 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;[39]
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 gooseberry, 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,[40] they are armed with

A thousand steely points on every scale
Form the bright terrors of his bristly male[41].—
So arm'd, immortal Moore uncharm'd the spell,
And slew the wily dragon of the well.—[42]
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 harvest 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[43] clumps of hollies in Needwood-forest serve as landmarks 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[44] 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.[45]

So WRIGHT's[46] bold pencil from Vesuvio's hight[47]
Hurls his red lavas to the troubled night;
From Calpè[48] 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[49] plains;[50]

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.[51]

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[52] 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[53] 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 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[55] shook her plumy crest,
And bound in rigid mail her jutting breast;[56]
Poised her long lance amid the walks of war,
And Beauty thunder'd from Bellona's[57] 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 withering 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[58] charm'd to rest,[59]
Indulgent Sleep! Beneath thy eider[60] breast,
In fields of Fancy climbs the kernel'd[61] 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[62] 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[63] 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.[64] He says that Mariotte[65] 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 bright from earth amid the troubled air
Ascends fair COLCHICA with radiant hair,[66]
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,[67]
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.[68]

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[69] 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.[70] 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.[71]

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[72] ripen their seed in the ensuing spring; but in this country their seeds seldom ripen. Lin. Spec. Plant.[73] Miller's Dict.[74]

GREAT HELIANTHUS guides o'er twilight plains
In gay solemnity his Dervise-trains;[75]
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,[76] not by twisting its stem. (Hales veg. stat.[77]) 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,[78] as they fly. Other seeds are disseminated by animals; of these some attach themselves to their hair or feathers by a gluten,[79] 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,[80] 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. Carlïna.

Queen of the marsh, imperial DROSERA treads
Rush-fringed banks, and moss-embroider'd beds;[81]
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,[82] 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.[83] 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 LONICERA prints the dewy lawn,
And decks with brighter blush the vermil[84] 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, monkshood, 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.[85]

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 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 the 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[86] his azure crest,
Aspiring DRABA builds her eagle nest;
Her pendant[87] 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 plants of this class possess similar virtues; they are termed acrid and antiscorbutic[88] 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,[89] which became extinct about the year 1684. Philos. Trans.[90] 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.[91] Are these congelations in consequence of the daily solution of the hoar-frost which is produced on the summit during the night?

Stay,[92] bright inhabitant of air, alight,
Ambitious VISCA, from thy eagle-flight![93] —
——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.[94]) 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.[95] 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[96] 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[97] 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.[98] 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[99] root, thick, and every where covered with the most soft and dense wool, intensely yellow. Lin. Spec. Plant.[100]

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. II. p. 646.[101] but thinks some art had been used to give it an animal appearance. Dr. Hunter, in his edition of the Terra of Evelyn,[102] 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[103] 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 the 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;[104] 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. 3[0]1. 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 resembles 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[105] together; this would seem to shew that the office of this surface of the leaf was to expose the fluids of the plants 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.[106]

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[107] of her Lord. —
So sinks or rises with the changeful hour
The liquid silver[108] in its glassy tower.
So turns the needle to the pole it loves,
With fine librations[109] 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[110] says this flower never opens its petals but when the wind blows; whence its name:[111] 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[112] pore on the claw[113] of each petal.

The Swallow. l. 322. There is a wonderful conformity between the vegetation[114] of some plants, and the arrival of certain birds of passage. Linneus observes that the wood

"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[115] paints them, and whose breath perfumes;
"O chase the Fiend of Frost, with leaden mace
"Who seals in death-like sleep my hapless race;[116]
"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 marygold, Caltha, when the cuckoo sings. Near the same coincidence was observed in England by Stillingfleet.[117] 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.[118] 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.[119] 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.)[120] 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[121] 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[122] 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.)[123] This accounts for the very rapid vegetation in the northern latitudes after the solution of the snows.

The increase[124] 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.[125] 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[126] bends his dizzy brow
O'er Conway,[127] listening to the surge below;
Retiring LICHEN climbs the topmost stone,
And 'mid the airy ocean dwells alone.—[128]
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 sail the clouds *beneath.*—
The steepy path her plighted swain pursues,
And tracks her light step o'er th' imprinted dews,
Delighted Hymen[129] 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 o'er their *secret* vows his influence chaste,
And decks with roses the admiring waste.

High in the front of heaven when Sirius[130] 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 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[131] 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.[132] Dr. Sloane[133] 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.[134]

{Silphium perfoliatum has a cup round every joint to reserve water after rain. It rises during the summer twelve or fourteen feet high on a slender stem, which is square, and thus is stronger to resist the winds than if it had been made round with the same quantity of materials.

The most curious plant of this kind is the Sarracenia purpurea, which resembles the Nymphœa, an aquatic plant, but catches so much water in its sessile[135] cup-like leaves, as to enable it to live on land, a wonderful provision of nature! System. Plant. a Reichard. Vol. II. p. 577.[136]}[137]

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,
Her vermil[138] 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.[139] Animals fed with madder for the purpose of these experiments were found upon dissection to have thinner gall. Comment. de rebus. Lipsiæ.[140] 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;[141]
O'er Age's cheek the warmth of youth diffuse,
Or deck the pale-eyed nymph in roseate hues.
So when MEDEA[142] to exulting Greece
From plunder'd COLCHIS[143] 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[144] 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.[145] 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.[146]

{Where Java's[147] isle, horizon'd with the floods,
Lifts to the skies her canopy of woods;
Pleased EPIDENDRA climbs the waving pines,
And high in heaven the intrepid beauty shines,
Gives to the tropic breeze her radiant hair,
Drinks the bright shower, and feeds upon the air.
Her brood delighted stretch their callow[148] wings,
As poised aloft their pendent cradle swings,
Eye the warm sun, the spicy zephyr breathe,
And gaze unenvious on the world beneath.}[149]

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.

{*Epidendrum flos aeris*. l. 393. Of the class of gynandria, or feminine males. This parasite plant is found in Java, and is said to live on air without taking root in the trees on which it grows; and its flowers resemble spiders. Syst. Veg. a Reichard. Vol. IV. p. 35.[150] By this curious similitude the bees and butterflies are supposed to be deterred from plundering the nectaries. See Visca.}

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.[151] 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.[152] 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.[153]

[Figure: Vallisneria Spiralis. Engraved by Fred.k P. Nodder.[154]]

For him she breathes the silent sigh, forlorn,
Each setting-day; for him each rising morn.—
"Bright orbs, that light yon high ethereal 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[155] 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;[156] 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.[157] The air contained in these cells was found by Dr. Priestley[158] to be sometimes purer than the 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[159] approves,
And hovering halcyons[160] 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[161] steers her silver shell;

secretes this air from the blood of the animal. (Monro. Physiol. of Fish. p. 28.[162]) To determine whether this air, when first separated from the blood of the animal or plant, be dephlogisticated air,[163] 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[164] of quadrupeds, are respiratory organs rather than nutritious ones.

The air in the hollow stems of grasses, and of some umbelliferous[165] 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.[166]

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,[167] 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 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[168] peep amid the rocks;
Pleased trains of Mermaids rise from coral cells;
Admiring Tritons[169] 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[170] 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[171] swept along the ground;
The misty moon withdrew her horned light,
And sunk with Hesper[172] 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[173] 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.[174] 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[175] 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[176] 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 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,[177] and climbs along the line;
Gay Gnomes[178] in glittering circles stand aloof
Beneath a spreading mushroom's fretted roof;
Swift bees returning seek their waxen cells,
And Sylphs[179] cling quivering in the lily's bells.
Through the still air descend the genia[l][180] showers,
And pearly rain-drops deck the laughing flowers.

[1] Elemental spirits of air, along with Gnomes as spirits of earth, Nymphs spirits of water, and Salamanders spirits of fire, according to the system of the alchemist Paracelsus (1493–1541). In the "Apology," at the beginning of *The Economy of Vegetation*, ED writes, "The Rosicrucian doctrine of Gnomes, Sylphs, Nymphs, and Salamanders, was thought to afford a proper machinery for a Botanic poem; as it is probable, that they were originally the names of hieroglyphic figures representing the elements." (See Appendix 1.4.) The Rosicrucians were a secret society, dating back legendarily to 1484 but historically to 1614. They claimed magical knowledge including power over the elements and elemental spirits; they based much of their alchemy on Paracelsus. In English literature, "Rosicrucian machinery" is associated with *The Rape of the Lock* (1717) by Alexander Pope (1688–1744). In a prefatory letter, Pope explains that "The *machinery* [...] is a term invented by the Critics, to signify that part which the Deities, Angels, or Demons, are made to act in a Poem," and that according to the Rosicrucians, "the four elements are inhabited by spirits, which they call Sylphs, Gnomes, Nymphs, and Salamanders. The Gnomes, or Demons of Earth, delight in mischief; but the Sylphs, whose habitation is in the air, are the best-conditioned creatures imaginable."

[2] Alternate spelling of "choirs." "Quire" can also signify paper folded into leaves, or a set of sheets of paper making up one twentieth of a ream.

[3] A musical pipe made of the hollow stem of the oat, associated with pastoral poetry. ED discusses this use of oat stems and reeds in his note to *LOTP* II:328n., and in IV:77–8 and note.

[4] John Ray (originally Wray) (1627–1705), theologian and naturalist, an internationally influential British botanist. His works include the ambitious taxonomy *Historia Plantarum* (1686–1704). Stellaria aquatica is found in Book XXIII, Ch. VI (Vol. 2, p. 1323).

[5] 1791, 1794, 1799: "delighted"
[6] Linnaeus, *Species Plantarum* (first published 1753). Dodecatheon is found in Vol. 1, pp. 144–45.
[7] Richard Mead (1673–1754), physician and collector of books and art. While studying medicine at Leiden, he also studied botany. He is best known for his *Short Discourse Concerning Pestilential Contagion and the Methods to be used to Prevent it* (1720). He was a patron of antiquarians, natural philosophers, and naturalists, including Mark Catesby (1683–1749), who named the American cowslip after him. See Catesby, *The Natural History of Carolina, Florida and the Bahama Islands* / *Histoire Naturelle de la Caroline, la Floride, & les Isles Bahama* (1729–1747; a bilingual English and French publication), Appendix, Plate I and description. In the description, Catesby writes, "To this new Genus of Plants I have given the name of the learned Dr. *Richard Mead* […] in gratitude for his zealous patronage of Arts and Sciences in general, and in particular for his generous assistance towards carrying the original design of this work into execution."
[8] Natural affection of parents for their offspring.
[9] Botanical artist and publisher Frederick Polydore Nodder (fl. 1773–1800). He also designed and etched the illustrations for *Thirty-Eight Plates with Explanations* (1788) and *Flora Rustica* (1792), both by botanist Thomas Martyn (1735–1825). Another version of this illustration had been used in 1789 (see Appendix 1.2).
[10] In *A System of Vegetables* (1783), a translation of Linnaeus by ED as part of the Botanical Society of Lichfield, frustraneous polygamy is described as "when the married females are fertile, and the Concubines barren. / That is, *when the hermaphrodite flowers of the disk are furnished with a stigma, and produce seeds; but the florets which constitute the circumference, having no stigma produce no seeds*" (Vol. 1, p. 25). "Frustraneous" means useless or ineffectual.
[11] In 1789, the remainder of this note (from "The opulus" to "all things.") appears in a Supplement placed after the indexes.
[12] "Fundamenta Entomologiæ," a dissertation proposed by Andreas Johannes Bladh (1748–1834), no. CXXXIII in *Amœnitates Academicæ* Vol. 7 (1769), pp. 129–59. ED's reference is to p. 146. *Amœnitates Academicæ* [Academic Delights] (1749–1790) was a series directed by Linnaeus that published dissertations in Latin by scholars of natural history at the University of Uppsala. Most of these dissertations were written primarily by Linnaeus, with the student acting as an assistant.
[13] Héloïse (c. 1098–1164) fell in love with her tutor, the philosopher and theologian Peter Abelard (1079–1142). She became pregnant and they secretly married, but when her uncle, Canon Fulbert, found out, he had Abelard castrated. Abelard became a monk and she a nun. The correspondence of these iconic tragic lovers (which ranges from erotic to theological) was much admired in the seventeenth and eighteenth centuries. They inspired "Eloisa to Abelard" (1717) by Alexander Pope (1688–1744), which ED quotes in *LOTP* Interlude III, p. 142.
[14] Linnaeus's *Philosophia Botanica* (1751), an elaboration on his previous *Fundamenta Botanica* (1736) in which he had presented his botanical theories in the brief form of aphorisms.

[15] An arrangement of flowers with a single flower on the end of the primary axis, with additional flowers on additional axes, developing successively.
[16] The outer part of a flower; the calyx and corolla. In ED's time, the word could refer to the calyx alone.
[17] Linnaeus's *Philosophia Botanica* (1751). ED's reference is to No. 185.
[18] Colin Milne (c.1743–1815), clergyman, botanist, and author of *A Botanical Dictionary, or, Elements of Systematic and Philosophical Botany* (1770). He also published *The Institutes of Botany* (1771–1772), a translation of Linnaeus's *Genera Plantarum* (first published 1737).
[19] Constantine, Roman emperor, ruled from 306 to 337 CE; Eugene IV was Pope from 1431 to 1447.
[20] Thucydides (c. 460–c.400 BCE), Greek historian. ED's reference is to Book II, part 34 of *History of the Peloponnesian War*.
[21] Horace, (65–8 BCE), Roman writer. ED quotes *Ars Poetica* 331–32. "Can we hope for poems to be fashioned, worthy to be smeared with cedar-oil, and kept in polished cypress?" (Trans. H. Rushton Fairclough, Loeb Classical Library).
[22] Dactylopius coccus, insects that feed on cacti, native to Mexico and Peru, and cultivated for cochineal pigment in Central America, southern Europe, and North Africa.
[23] See Shakespeare, *Othello*, 1.3.149–96.
[24] One of the chaffy bracts forming the calyx; a husk.
[25] Amentum, or catkin.
[26] In 1789, this paragraph appears in a Supplement placed after the indexes.
[27] Viviparous: bringing forth young in a live state. Oviparous: reproducing by eggs hatched outside the body of the parent.
[28] "Fundamenta Entomologiæ," a dissertation proposed by Andreas Johannes Bladh (1748–1834), no. CXXXIII in *Amœnitates Academicæ,* Vol. 7 (1769), pp. 129–59. ED's reference is to p. 149. *Amœnitates Academicæ* [Academic Delights] (1749–1790) was a series directed by Linnaeus that published dissertations in Latin by scholars of natural history at the University of Uppsala. Most of these dissertations were written primarily by Linnaeus, with the student acting as an assistant.
[29] Also known as an Aeolian harp, an instrument that produces music when a breeze passes over the strings.
[30] *Discorso della irritabilita d'alcuni fiori nuovamente scoperta* (1764) by Giovambatista dal Covolo (1739–1768)*,* translated from the Italian by Benjamin Stillingfleet (1702–1771) as *A Discourse Concerning the Irritability of Some Flowers: A New Discovery*, published by J. Dodsley in 1767.
[31] Virgin goddess of the hunt in Roman mythology, the counterpart of Artemis in Greek mythology. She is identified with the moon and is also a protector in pregnancy and childbirth.
[32] Ninon (Anne) de l'Enclos (1620–1705) was a French courtesan and writer; she held a *salon* in Paris attended by literary and political luminaries. Anna Seward (1742–1809) explains, "Ninon retained a large portion of her personal beauty and graces to an almost incredible period […] it was considerable enough to procure her young lovers at the age of eighty […]. When her son, by Lord Jersey, was a

young officer about Court, known to her but unknown to himself, Madame de L'Enclos was scarcely forty years old" (Seward, *Memoirs of the Life of Dr. Darwin* (1804), pp. 287–88.) See Appendix 4.1.

[33] In 1789, the Ninon passage (I:125–38) is not a separate verse paragraph, and is shorter: "So NINON pruned her wither'd charms, and won / With harlot-smiles her gay unconscious son;— / Clasp'd in his arms she own'd a mother's name, / Shook her grey locks, and tittering mock'd his flame; / With mad despair he plunged the guilty dart, / And life and love gush'd mingled from his heart!" ED revised the lines in response to Anna Seward's objection to their "personal and mental injustice" to "this extraordinary woman" (Seward, *Memoirs of the Life of Dr. Darwin* (1804), pp. 287, 289). See Appendix 4.1.

[34] Botanical artist and publisher Frederick Polydore Nodder (fl. 1773–1800). He also designed and etched the illustrations for *Thirty-Eight Plates with Explanations* (1788) and *Flora Rustica* (1792) by botanist Thomas Martyn (1735–1825).

[35] *Supplementum Plantarum* (1781) by Carl Linnaeus Jr. (1741–1783) was a supplement to Linnaeus's *Systema Vegetabilium* (13th ed., 1774), *Genera Plantarum* (6th ed., 1764), and *Species Plantarum* (2nd ed., 1762–1763).

[36] Botanical artist and publisher Frederick Polydore Nodder (fl. 1773–1800). He also designed and etched the illustrations for *Thirty-Eight Plates with Explanations* (1788) and *Flora Rustica* (1792) by botanist Thomas Martyn (1735–1825).

[37] Botanical artist and publisher Frederick Polydore Nodder (fl. 1773–1800). He also designed and etched the illustrations for *Thirty-Eight Plates with Explanations* (1788) and *Flora Rustica* (1792), both by botanist Thomas Martyn (1735–1825).

[38] The verses (I:151–60) and note on Amaryllis do not appear in 1789.

[39] "Fane" here means a weathercock, and "vane" the part of it that turns to show the direction of the wind.

[40] Needwood Forest was located in East Staffordshire, not far from Lichfield where ED lived from 1756 to 1781. It was the subject of a poem, *Needwood Forest* (1776), by his friend Francis Noel Clarke Mundy (1739–1815) which opposed the felling of its trees. See also *LOTP* IV:33–6 and Additional Notes.

[41] 1789, 1791, 1794, 1799: "mail"

[42] A reference to "The Dragon of Wantley," a seventeenth-century comic ballad, printed in 1685 as "A True Relation of the Dreadful Combate between More of More Hall and the Dragon of Wantley," often reprinted in collections of songs; it was later included in *Reliques of Ancient English Poetry* (1765) edited by Thomas Percy (Vol. 3, pp. 277–86). To fight the dragon, More of More-Hall "went, new armour to / Bespeak at Sheffield town; / With spikes all about, not within but without, / Of steel so sharp and strong; / Both behind and before, arms, legs, and all o'er / Some five or six inches long," in which he looked like "Some Egyptian porcupig" or "Some strange outlandish hedge-hog" (quoted from Percy, lines 75–80, 84, 88). The dragon is associated with a well into which he would cough out his "burning snivel" (lines 101, 43–6). Moore's strategy was to ambush the dragon by hiding in a well "Where he did think, this dragon would drink" (line 101). Ultimately More defeated the beast with a "kick on the Arse"

(see stanza 17 in the 1685 version and line 136 in Percy where the four-letter word is rendered "...."). A spell isn't mentioned, except "Some say, this dragon was a witch; / Some say he was a devil" (lines 41–3). The poem associates "wit" with More and "strength"—rather than wiles—with the dragon (lines 97–8), though it does endow the dragon with the power of speech. A popular burlesque opera, *The Dragon of Wantley* (1737), with libretto by Henry Carey (?1687–1743) and music by John Frederick Lampe (1702/3–1751), was based on the ballad.

[43] In 1789, this passage (from "The numerous" to "as it is called.") appears in the Additional Notes. The remainder of the note (from "There is" to "p. 782.") does not appear in 1789.

[44] Also known as mineral caoutchouc or elaterite; a brown hydrocarbon that is elastic like india-rubber.

[45] *A System of Vegetables* (1783), a translation of Linnaeus's *Systema Vegetabilium* (1774) and Linnaeus Jr.'s *Supplementum Plantarum* (1781), largely by ED and credited to the Botanical Society of Lichfield, which also included Brooke Boothby (1744–1824) and William Jackson (1735–1798). See *LOTP* Preface vii–viii and editor's notes. ED's reference is found in Vol. 2.

[46] Joseph Wright of Derby (1734–1797), painter. ED (who had moved to the Derby area in 1781) was Wright's physician, and Wright painted two portraits of him. Wright's best-known work is the scientifically themed painting, *An Experiment on a Bird in the Air Pump* (1768).

[47] These lines (I:175–82, from "So WRIGHT's" to "hoary brink.") do not appear in 1789.

[48] Latin name of Gibraltar.

[49] Possibly an alternate spelling of Odisha, a state in eastern India, formerly known as Orissa.

[50] 1789: "The grace and terror of her wide domains;"

[51] Wright began to do landscape paintings later in his career, from about 1770. He painted many scenes of the valley of the river Derwent in Derbyshire, including moonlight scenes; examples include two versions of *Matlock Tor, Moonlight* (c. 1778–1780) and *Arkwright's Cotton Mills, by night* (c. 1782–1783; on Arkwright, see ED's note to II:87 and editor's note). He travelled in Italy 1773–1775 and climbed to the summit of Vesuvius during an eruption. He produced thirty views of Vesuvius, including *Vesuvius in Eruption, with a View over the Islands in the Bay of Naples* (c. 1776–1780). His *View of Gibraltar During the Destruction of the Spanish Floating Batteries, 13 September 1782* (1785) featured in a one-man show in London in 1785.

[52] Michel Adanson (1727–1806), French botanist. He spent four years in Senegal from 1749, employed by the Compagnie des Indes (the French East India company), and brought back many plant specimens. As well as *Histoire naturelle du Sénégal* (1757), referred to here, he wrote *Familles des plantes* (1763), putting forward a natural system of classification which considered all parts of the plant, against Linnaeus's sexual system. All of the details in ED's reference (except the measurement of the breadth at the top of the tree) can be found in the August 1749 section, pp. 54–5 of the original French, and pp. 96–9 of the English translation, *A Voyage to Senegal, the Isle of Goreé, and the River Gambia* (1759).

[53] 1791, 1794, 1799: "from"
[54] This line is numbered 190, though it is really line 188; all line numbers in Canto I from this point on are off by two, including those given in ED's notes. To avoid confusion when comparing with the page images, the incorrect numbering is not emended here.
[55] Thalestris was a queen of the Amazons, a legendary tribe of women warriors. According to *The Library of History* by Sicilian Greek historian Diodorus Siculus (c. 90–c. 30 BCE), "She was remarkable for beauty and for bodily strength, and was admired by her countrywomen for bravery." Along with "an escort of three hundred Amazons in full armour," she sought out Alexander the Great and told him she came to him "for the purpose of getting a child. He had shown himself the greatest of all men in his achievements, and she was superior to all women in strength and courage, so that presumably the offspring of such outstanding parents would surpass all other mortals in excellence. At this the king was delighted and granted her request and consorted with her for thirteen days, afterwards he honoured her with fine gifts and sent her home" (17.77.1–3; trans. Charles Henry Oldfather, Loeb Classical Library).
[56] 1789: "So fair Thalestris bound her jutting breast / In rigid mail, and shook her plumy crest;— "
[57] Roman goddess of war.
[58] A small rodent known for its hibernation.
[59] In 1789, these lines (I:209–10) read: "So to his mossy couch the Dormouse springs, / And Sleep protects him with his eider wings.—" The following two lines (I:211–12, from "In fields" to "his loves.—") are absent.
[60] Eiderdown, or soft feathers.
[61] Full of seeds or grain.
[62] 1791, 1794, 1799: "in winter"
[63] In 1789, this paragraph appears in a Supplement placed after the indexes.
[64] "Prolepsis Plantarum," a dissertation proposed by Johann Jakob Ferber (1743–1790), no. CXX in *Amœnitates Academicæ* Vol. 6 (1763), pp. 365–83. ED's reference is to pp. 381–83. *Amœnitates Academicæ* [Academic Delights] (1749–1790) was a series directed by Linnaeus that published dissertations in Latin by scholars of natural history at the University of Uppsala. Most of these dissertations were written primarily by Linnaeus, with the student acting as an assistant.
[65] Edme Mariotte (1620–1684), member of the Paris Académie des sciences from its foundation, known primarily as a physicist. Ferber cites Mariotte in section 10 of his paper.
[66] 1789: "Bright out of earth, amid the driving storm, / Ascends fair COLCHICA! thy roseate form;" 1794, 1799: "Then bright from earth amid the troubled sky / Ascends fair Colchica with radiant eye,"
[67] Uranus was discovered by musician and self-taught astronomer William Herschel (1738–1822) in 1781, who named it the Georgian star (Georgium Sidus), after King George III. The silver guards are likely moons of Uranus, two of which were reported by Herschel in 1787.
[68] These two lines (I:221–2, from "Hangs" to "storm.") do not appear in 1789.
[69] *The Families of Plants* (1787), a translation of the 1778 edition of Linnaeus's *Genera Plantarum* (first published 1737), largely by ED and

credited to the Botanical Society of Lichfield, which also included Brooke Boothby (1744–1824) and William Jackson (1735–1798). *The Families of Plants* also draws on Linnaeus's two *Mantissæ Plantarum* ("mantissa" means "supplement") (1767, 1771), Carl Linnaeus Jr.'s *Supplementum Plantarum* (1781), and works by botanists Carl Peter Thunberg (1743–1828) and Charles Louis L'Heritier de Brutelle (1746–1800). See *LOTP* Preface vii–viii and editor's notes. ED's reference is found in Vol. 1.

[70] *The Gardeners Dictionary* by horticulturalist Philip Miller (1691–1771) was first published in 1732 and went through eight editions in his lifetime; there was also an abridged version in eight editions (first published 1735). Miller was the gardener for the Chelsea Physic Garden of the Society of Apothecaries from 1722 to 1770. ED's reference is to the entry for Colchicum.

[71] Linnaeus's *Philosophia Botanica* (1751) elaborated on his previous *Fundamenta Botanica* (1736), in which he had presented his botanical theories in the brief form of aphorisms. ED's reference is to No. 335.

[72] State on the Atlantic coast of the eastern United States, and one of the thirteen colonies that declared independence from Britain and formed the United States of America in 1776.

[73] Linnaeus, *Species Plantarum* (first published 1753). Hamamelis is found in Vol. 1, p. 124.

[74] ED's reference is to the entry for Hamamelis (*Virginiana*).

[75] "Dervise" is an alternate spelling of "dervish," a member of the mystical Islamic order of the Sufis who were known for rituals involving vigorous physical movement, as in the expression "whirling dervish."

[76] Movement of a plant stem or root caused by variation in the rate of growth on different sides.

[77] Natural philosopher Stephen Hales (1677–1761) was a fellow of the Royal Society and also a parish priest in the Church of England. His 1727 work, *Vegetable Staticks,* shares the results of experiments examining the effect of the sun's rays on plant sap. ED's reference is to p. 39 where Hales explains the cause of the nutation: "the side of the stem next the Sun perspiring most, it shrinks, and this plant perspires much."

[78] A piece of cork with a circle of feathers, hit with rackets in the children's game of battledore and shuttlecock, or, after ED's time, in the game of badminton.

[79] A sticky substance.

[80] Structures that open to release the seeds of a flowering plant and then return to their previous form.

[81] 1789: "Queen of the dewy vale, fair DROSERA treads / Her moss-wove banks, and rushy-fringed beds;"

[82] An unidentified Mr. Wheatly is mentioned by ED in two letters (King-Hele, ed., *Letters*, 79-11, 88-16).

[83] Pierre Marie Auguste Broussonet (1761–1807) was a member of both the Royal Society and the Académie des sciences and Secretary of the Societé d'agriculture before the French Revolution. He spent time in England in the early 1780s and had connections with Joseph Banks (1743–1820), naturalist, patron of science, and President of the Royal Society (1778–1820). ED refers to Broussonet's "Essai de

comparaison entre les mouvemens des Animaux & ceux des Plantes, &c." in *Histoire de l'Académie Royale des Sciences* (1784), pp. 609–21.
[84] Vermilion; bright red.
[85] *The Economy of Vegetation* Additional Note XXXIX.—Vegetable Glandulation.
[86] The largest of the Canary Islands, located in the Atlantic Ocean off the coast of southern Morocco.
[87] These lines (I:253–4, from "Her pendant" to "ground.") do not appear in 1789.
[88] Of use against scurvy.
[89] El Pico del Teide (Teide Peak).
[90] *Philosophical Transactions of the Royal Society of London*. ED is likely referring to J. Edens, "An Account of a Journey from the Port of Oratava in the Island of Tenerife to the Top of the Pike in that Island, in August last; with Observations thereon" in Vol. 29 (1714–1716), pp. 317–25, though it does not give a date for the volcano's extinction.
[91] Watkin Tench (bap. 1758–d. 1833) was a British marine officer and author. His 1789 book, *A Narrative of the Expedition to Botany Bay*, offers "an Account of New South Wales, its Productions, Inhabitants, &c." Tench stayed in New South Wales from 1788 to 1791. ED's reference is found in Chapter 3, "From the Fleet's Arrival at Tenerife, to its Departure for Rio de Janeiro, in the Brazils".
[92] 1791, 1794, 1799: "Oh, stay,"
[93] 1791, 1794, 1799: "Angel-flight!"
[94] *Philosophical Transactions of the Royal Society of London*. ED's reference is to "On the Usefulness of washing and rubbing the Stems of Trees, to promote their Annual Increase," Vol. 67 (1777): pp. 12–4, and its sequel, "A further Account of the Usefulness of washing the Stems of Trees," Vol. 71 (1781): pp. 449–53, both by Robert Marsham (1708–1797), a naturalist primarily known as a pioneer of phenology, or recording seasonal changes.
[95] English naturalist James Barbut (fl. 1776–1791), also known as Jacques Barbut. *The Genera Vermium Exemplified by Various Specimens of the Animals Contained in the Orders of the Intestina et Mollusca Linnæi: drawn from nature* (1783) has parallel texts in English and French. He discusses Scyllaea on pp. xi and 19. Scyllaea is a genus of nudibranch or sea slug, of the phylum of molluscs; however, Barbut gives its common name as sea onion.
[96] Catholic priest and natural scientist John Turberville Needham (1713–1781). ED refers to Needham's *An Account Of Some New Microscopical Discoveries* (1745), specifically p. 74 of its "Observations on the *Farina fœcundans* of Plants."
[97] An eolipile is an early form of steam technology: a container in which heated vapour escapes through apertures and causes the container to rotate.
[98] Italian biologist Lazzaro Spallanzani (1729–1799) pursued a broad range of scientific research and was particularly interested in reproduction. His *Dissertazioni di fisica animale e vegetabile,* published in Italian in 1780, was translated into English as *Dissertations relative to the Natural History of Animals and Vegetables* in 1784 by ED's friend, chemist and physician Thomas Beddoes (1760–1808).

[99] When used as a botanical term, decumbent means trailing on the ground but with the extremity ascending.
[100] Linnaeus, *Species Plantarum* (first published 1753). Polypodium Barometz is found in Vol. 2, p. 1092.
[101] Physician and collector Hans Sloane (1660–1753) acquired many natural history specimens from his own travels (particularly in the West Indies) and from others. His vast collection and library became one of the founding collections of the British Museum. He was President of the Royal Society from 1727 to 1741. Sloane's article, "A further Account of the Contents of the China Cabinet mentioned last Transaction," is summarized in John Lowthorp (1658/9–1724), *The Philosophical Transactions, and Collections, To the End of the Year 1700. Abridg'd and Dispos'd under General Heads*, Vol. 2 (first published 1705), Chapter V, section XXVI, p. 646; and the illustration is Fig. 160 on the plate facing p. 662. The full article can be found in *Philosophical Transactions* Vol. 20, no. 247 (1698): pp. 461–62.
[102] Alexander Hunter (1729?–1809) was a Scottish physician best known for his editions, with illustrations and notes, of works by John Evelyn (1620–1706). Evelyn wrote on a wide range of topics in the arts and sciences, including gardening. *A Philosophical Discourse of Earth* (in later editions with *Terra* added as the main title) was first published in 1676 and focuses on soil. Hunter's edition, *Terra: A Philosophical Discourse of Earth,* was released in 1778. The Tartarian Lamb is discussed on p. 118. The illustration was first included in the 1786 edition of *Terra* (in Volume 2 of Hunter's edition of Evelyn's *Silva: or, a Discourse of Forest-Trees*) and was the basis for the almost identical illustration included in *LOTP* 1799 (see Appendix 1.2).
[103] Perhaps describing the horny plates that emerge from the upper jaw of a toothless baleen whale.
[104] Capillary attraction draws a fluid up a narrow channel or a porous material as a result of surface forces.
[105] Pressed close.
[106] *The Economy of Vegetation* Additional Note XXXVII.—Vegetable Respiration.
[107] Harem; the area reserved for the women of a Muslim palace.
[108] Quicksilver, or mercury, in a thermometer.
[109] Balance involving oscillation or swaying.
[110] Roman author Pliny the Elder (23–79 CE) discusses the anemone in Book 21, 94.165 of his *Naturalis Historia* [Natural History], a compendium of ancient thought on art, science, and culture.
[111] The Greek root *anemos* means wind, and *-one* is a feminine patronymic suffix (indicating "daughter of").
[112] Producing honey.
[113] The narrow, sharp base of the petal by which it is attached.
[114] An instance or stage of plant growth.
[115] A paintbrush made with fine hair tapered to a point.
[116] 1789: ""O chase the Fiend of Frost, whose leaden mace / "In death-like slumbers seals my hapless race;" 1791: ""O chase the Fiend of Frost, with leaden mace / Who sears in death-like sleep my hapless race;" 1794: ""Oh chase the Fiend of Frost, with leaden mace / Who seals in death-like sleep my hapless race;"

[117] Benjamin Stillingfleet (1702–1771), botanist and writer. His *Miscellaneous Tracts* (1759), along with an original essay on grasses and a preface explaining the Linnaean system, includes translations of selected essays from the *Amœnitates Academicæ* [Academic Delights], a series that published dissertations in Latin by scholars of natural history at the University of Uppsala. Most of these dissertations were written primarily by Linnaeus, with the student acting as an assistant. Stillingfleet's *Calendar of Flora*, in which he juxtaposes English and Swedish observations of the timing of the migration of birds and the blooming of flowers, was published in the second edition of *Miscellaneous Tracts* in 1762 (see II:165n.). Here ED refers to a footnote by Stillingfleet on his translation of "On the foliation of trees" by Harald Barck (2nd. ed., pp. 148–9).

[118] ED may be thinking of Mary Wortley Montagu (bap. 1689, d. 1762), whose *Letters Written during her Travels* (often called *The Turkish Embassy Letters*) were published in 1763. She gives a sample of "Turkish Verses" which begin with a couplet on the nightingale's passion for roses (Vol. 2, p. 48). ED may also have in mind the fable of "The Gardener and the Nightingale," in which both adore a rose, translated and analyzed in *Grammar of the Persian Language* (1771; pp. 109–19) by orientalist and philologist William Jones (1746–1794). Verses from the poet Hafiz (d. c. 1390) are part of his translation.

[119] George Fordcye (1736–1802) was Physician to St. Thomas's Hospital, a founder of the Society for the Improvement of Medical and Chirurgical Knowledge, and a fellow of the Royal College of Physicians, as well as the Royal Society; he was also a member of Samuel Johnson's (1709–1784) literary club. His *Elements of Agriculture and Vegetation* (1765) analyzes the chemical compounds, and the physiological structures, that drive plant growth. He refers to the acquired habits of plants at the end of Part III.

[120] Swedish botanist Pehr Kalm (1716–1779) was a student of Linnaeus who travelled in England and North America collecting plant specimens. He shared his experiences in *En resa til Norra America* (1753–1761), translated as *Travels into North America* (1770–1771) by Johann Reinhold Forster (1729–1798), who was the naturalist on James Cook's second circumnavigation of the globe (1772–1775). ED's reference is found in the May 1749 section, Vol. 2, p. 167 of the English translation.

[121] A hood of silk, with a bone or cane structure, projecting beyond the face.

[122] A four-wheeled carriage, the top of which may be opened.

[123] John Kennedy (1759–1842), *A Treatise upon Planting, Gardening and the Management of the Hot-House* (1776). Kennedy was gardener to Sir Thomas Gascoigne, the eighth baronet of Parlington in west Yorkshire. The book discusses, among many subjects, the growth of exotic plants and experimentations in fodder crops, giving practical instructions. Vines are discussed in Vol. 1, Chapter 10.

[124] In 1789, this paragraph appears in a Supplement placed after the indexes.

[125] John Walker (1731–1803) was a minister of the Church of Scotland, professor of natural history and keeper of the museum at the University of Edinburgh. An extensive collector of natural specimens,

he also corresponded with Linnaeus. He was a leading figure in the establishment of the Royal Society of Edinburgh and contributed several papers to *The Transactions of the Royal Society of Edinburgh*. ED refers to his "Experiments on the Motion of the Sap in Trees," Vol. 1, Part 2 (1788), pp. 4–40.

[126] Snowdon, the highest mountain in Wales.

[127] The Afon Conwy, or River Conway, in north Wales. It rises at Llyn Conwy (Lake Conway), flows north, then reaches the sea as an estuary.

[128] 1791, 1794, 1799: "And drinks the aerial solitude alone.—"

[129] Greek and Roman god of marriage, represented as a young man carrying a torch. He is associated with the hymn (*hymenaios*) sung as the bride's train accompany her to the groom's house.

[130] A fixed star in the constellation Canis Major; the dog star associated with the dog days (hottest days) of summer.

[131] Nymphs of fresh water such as rivers or springs.

[132] William Dampier (1651–1715), buccaneer, explorer, and author, best known for his voyages to Australia. His "Two voyages to Campeachy" (Campeche, in southeast Mexico) makes up Part 2 of his *Voyages and Descriptions* (1699). He discusses the wild pine in Chapter II. *Voyages and Descriptions* was a supplement to his famous *A New Voyage Round the World* (1697).

[133] Physician and collector Hans Sloane (1660–1753) acquired many natural history specimens from his own travels (particularly in the West Indies) and from others. His vast collection and library became one of the founding collections of the British Museum. He was President of the Royal Society from 1727 to 1741. ED refers to Sloane's "Some Observations Made at a Meeting of the Royal Society, Concerning Some Wonderful Contriuances of Nature in a Family of Plants in Jamaica, to Perfect the Individuum, and Propagate the Species, with Several Instances Analogous to Them in European Vegetables," *Philosophical Transactions* Vol. 21 (1699): pp. 113–20. Sloane reprises the material in this essay's section on Wild Pine in Book I Chapter 9 of his "Natural History of Jamaica" in *A Voyage to the Islands Madera, Barbados, Nieves, S. Christophers and Jamaica* (1707).

[134] Johannes Burman (1707–1780), Dutch botanist and a mentor of Linnaeus. Burman's *Thesaurus Zeylanicus* (1737) provides a catalog of plants found in Sri Lanka. He discusses nepenthes under the earlier name of Bandura.

[135] Immediately attached by the base; not having a main stalk.

[136] *Systema Plantarum* (1779–1780), edited by Johann Jacob Reichard (1743–1782), consists of Linnaeus's *Systema Vegetabilium* (the botanical portion of *Systema Naturæ*, first published separately in 1774), *Species Plantarum* (1753), and the first and second *Mantissa Plantarum* ("mantissa" means "supplement") (1767, 1771). Reichard was a physician and botanist of Frankfurt. He also made the new edition of *Genera Plantarum* (1778) on which ED based the Botanical Society of Lichfield's translation, *The Families of Plants* (1787). Reichard had studied at Göttingen with Johan Andreas Murray (1740–1791) who was a student of Linnaeus and edited the 13th (1774) and 14th (1784) editions of *Systema Vegetabilium*.

[137] Inserted 1799

[138] Vermilion; bright red.

[139] John Belchier (bap. 1706–d. 1785), surgeon, was elected a fellow of the Royal Society in 1732, and appointed surgeon to Guy's Hospital in 1736. ED refers to "An account of the bones of animals being changed to a red colour by aliment only," followed by "A further account," in *Philosophical Transactions* Vol. 39 (1735–1736): pp. 287–88, 299–300.
[140] *Commentarii de rebus in scientia naturali et medicina gestis* [Commentaries on Achievements in Natural Science and Medicine] was a scientific journal compiled by Johannes Friedrich Gleditsch in Leipzig; it ran from 1752 to 1808. ED may be referring to article 26 in Vol. 1 (1752), a commentary on Johann Benjamin Boehmer's *Radicis rubiae tinctorum effectus in corpore animali* [The effects of the root of Rubia tinctorum on the animal body] (1751), which references Belchier.
[141] The threads that cross from side to side in a piece of weaving. By association, "woof" can also signify a woven fabric.
[142] In Greek mythology, Medea, daughter of the King of Colchis, fell in love with Jason, and defied her family by helping him steal the golden fleece by drugging the serpent that guarded it. The parts of her story ED refers to in this passage are told by Ovid in Book 7 of *Metamorphoses*. Medea also features in *LOTP* III:135–78.
[143] An ancient city on the coast of the Black Sea.
[144] When Medea returns to Iolcus with Jason, she uses her knowledge of magic and potions to rejuvenate his father Aeson, by boiling him in a cauldron with herbs. (She then pretends to go over to the side of Pelias, the usurper of Jason's throne, and persuades his daughters to rejuvenate him in a similar way but tricks them into murdering him.)
[145] In 1789, this note appears with the Additional Notes.
[146] 1789: "And locks luxuriant wanton round his brow."
[147] The island of Java is in Indonesia, between the Java Sea and the Indian Ocean, southeast of Sumatra. In the eighteenth century (including ED's time) it was mainly under Dutch control.
[148] Not yet feathered.
[149] Verses and note on Epidendrum inserted 1799
[150] Linnaeus's *Systema Vegetabilium* is the botanical portion of *Systema Naturæ* (1st ed. 1735), first published separately in 1774. *Systema Plantarum* (1779–1780), edited by Johann Jacob Reichard (1743–1782), consists of Linnaeus's *Systema Vegetabilium*, *Species Plantarum* (first published 1753), and the first and second *Mantissa Plantarum* ("mantissa" means "supplement") (1767, 1771). Reichard was a physician and botanist of Frankfurt. He also made the new edition of *Genera Plantarum* (1778), on which ED based the Botanical Society of Lichfield's translation, *The Families of Plants* (1787). Reichard had studied at Göttingen with Johan Andreas Murray (1740–1791), who was a student of Linnaeus and edited the 13th (1774) and 14th (1784) editions of *Systema Vegetabilium*.
[151] Linnaeus, *Species Plantarum* (first published 1753). Vallisneria is found in Vol. 2, p. 1015, but the entry specifies "Suecia & alibi" [Sweden and elsewhere] rather than Norway; the mention of the East Indies first appears in the thirteenth edition of *Systema Vegetabilium* (1774) edited by Johan Andreas Murray (1740–1791).
[152] Dactylopius cocchus is the cochineal insect; Lampyris is a genus including fireflies and glowworms; Phalæna means a moth, or

Linnaeus's grouping of moths excluding Sphinges or hawk-moths; Operophtera brumata is the winter moth; Dahlica lichenella is the lichen case-bearer moth.

[153] *The Families of Plants* (1787) is an English translation of the 1778 edition of Linnaeus's *Genera Plantarum* (first published 1737), largely by ED and credited to the Botanical Society of Lichfield, which also included Brooke Boothby (1744–1824) and William Jackson (1735–1798). *The Families of Plants* also draws on Linnaeus's two *Mantissæ Plantarum* ("mantissa" means "supplement") (1767, 1771), Carl Linnaeus Jr.'s *Supplementum Plantarum* (1781), and works by botanists Carl Peter Thunberg and Charles Louis L'Heritier de Brutelle (1746–1800). See *LOTP* Preface vii–viii and editor's notes. ED's reference is found in Vol. 2.

[154] Botanical artist and publisher Frederick Polydore Nodder (fl. 1773–1800). He also designed and etched the illustrations for *Thirty-Eight Plates with Explanations* (1788) and *Flora Rustica* (1792) by botanist Thomas Martyn (1735–1825).

[155] Folds.

[156] The town of Passau in Germany.

[157] Linnaeus, *Species Plantarum* (first published 1753). Ulva labyrinthiformis first appears in the second edition (1763), Vol. 2, p. 1633.

[158] Joseph Priestley (1733–1804) was a natural philosopher, dissenting clergyman, reformer, and a fellow member with ED of the Lunar Society. He published in the areas of English grammar, history, politics, and theology, as well as various branches of science. Among his many endeavours, he is known for the discovery of what would come to be called oxygen by isolating it in its gaseous state. ED refers to Section 29, "Of the State of Air confined in the Bladders of Sea Weed," in Priestley's *Experiments and Observations relating to various branches of Natural Philosophy; with a Continuation of the Observations on Air* (1779), pp. 313–20.

[159] Cyprus was associated with worship of Aphrodite and Venus, the Greek and Roman goddesses of love, sexual desire, and beauty.

[160] A bird fabled to breed in a nest floating on the sea around the time of the winter solstice and possess the power to calm the wind and waves. Associated with the kingfisher.

[161] A sea nymph. In Ovid's *Metamorphoses* 13:738–897, the Cyclops Polyphemus falls in love with her and kills his rival, Galatea's beloved Acis, with a boulder. Galatea then causes Acis's blood to turn into a river, and Acis into a river god.

[162] *The Structure and Physiology of Fishes Explained, and Compared with those of Man and Other Animals* (1785), an illustrated volume by Alexander Monro secundus (1733–1817), a practicing physician as well as Professor of Medicine from 1758, then Professor of Medicine, Anatomy and Surgery from 1777, at the University of Edinburgh. His father, Alexander Monro primus (1697–1767), had been Professor of Anatomy when ED studied medicine at Edinburgh 1754–1756.

[163] When Joseph Priestley (1733–1804) isolated oxygen, he named it dephlogisticated air. Phlogiston was a hypothetical substance believed to exist in all combustible bodies and to be released upon combustion. It was French chemist Antoine Laurent Lavoisier (1743–1794) who, in

opposition to phlogiston theory, would originate the term "oxygen," and ED would be among the first to espouse the new terminology in English in *The Economy of Vegetation* (1791).

[164] One of the patches of hairlike projections on the outermost membrane around the foetus, in ruminants; or the corresponding vascular portions of the uterine mucous membrane.

[165] With multiple stalks leading to multiple flower heads; plants belonging to the order Umbelliferæ.

[166] ED's reference is to "An Account of certain Receptacles of Air, in Birds, which communicate with the Lungs, and are lodged both among the fleshy Parts and in the hollow Bones of those Animals," *Philosophical Transactions* Vol. 64 (1774): pp. 205–13, by surgeon and anatomist John Hunter (1728–1793). Among Hunter's many influential accomplishments is his collection of comparative anatomy specimens, a portion of which still exists and is displayed in the Royal College of Surgeons.

[167] The accidental death of ship-carpenter John Day (c. 1740–1774) on 20 June 1774 was recorded in the 1775 work *A Philosophical Dissertation on the Diving Vessel Projected by Mr. Day and Sunk in Plymouth Sound.* The tract was written by Nikolai Detlef Falck (1736–1783), author of several works on medicine and technology.

[168] Nymphs of fresh water such as rivers or springs.

[169] Sea deities or monsters, half-man and half-fish, usually depicted holding a trident and a shell-trumpet.

[170] A river in the Peak District in the English Midlands, the Dove runs along the border between Staffordshire and Derbyshire. It rises near Buxton and flows southwards until it joins the river Trent near Burton. ED lived in Staffordshire from 1756 to 1781 and in Derbyshire from 1781 to 1802.

[171] God of the east wind.

[172] Hesperus, the evening star.

[173] The Ostyak people, now called Khanty, indigenous to the Ob River basin in western Siberia.

[174] *Russia: or, a compleat Historical Account of All the Nations which Compose that Empire* (1780–1783, 4 vols.) was printed by John Nichols (1745–1826). Published anonymously, it was authored by botanist, chemist, and geographer Johann Gottlieb Georgi (1729–1802) and translated from the German by William Tooke (bap. 1744, d. 1820), who was the Russia Company's chaplain in St. Petersburg as well as an active writer and translator. ED's references are to Vol. 1, pp. 189–91 in the section on "The Ostiaks" and Vol. 2, p. 398 in the section on "The Yakoutes."

[175] Edible.

[176] Wood nymphs.

[177] A ball of thread.

[178] Elemental spirits of earth, in the system of the alchemist Paracelsus (1493–1541). See editor's note to *LOTP* I:1.

[179] Elemental spirits of air, in the system of the alchemist Paracelsus (1493–1541). See editor's note to *LOTP* I:1.

[180] The error "genials" appears only in 1790.