The Flower — Sepr. 9th. 1807.

Every one may think that he knows what a flower is: it is however worthy of remark that botanists have been not a little puzzled in forming their definition of it. The celebrated French botanist Tournefort tells us that "a flower is a part of a plant very often remarkable for its peculiar colours, for the most part adhering to the young fruit, to which it seems to afford the first nourishment, in order to explicate its most tender parts". Is this a definition? Ponteder a, in his Anthology tells us that "a flower is a part of a plant unlike the rest in form and nature". Jussieu says "that is properly a flower, which is composed of stamina & a pistillum" But, some flowers have no pistillum. Vaillant advanced one step further, and asserts that "the flower ought, strictly speaking, to be reckoned the organs which constitute the different sexes in plants, for that the petals, which immediately envellope them, are only the coats to cover and defend them; but he adds "these coats are the most conspicuous and most beautiful part of the composition, & therefore to these shall I give the name of flower". Martyn defines a flower to be the organs of generation of both sexes, adhering to a common placenta, together with their common coverings", and this is much nearer the truth than the definition in Dr Johnson's Dictionary, where we are informed that "a flower is that part of a plant which contains the seeds" which definition is more applicable to a pea-pod. The early botanists meant by the term Anthus, Flos, or Flower, what is now understood in common parlance, by that term, namely, the rich & delicate looking petals or painted leaves, which end here to the seed vessel, or rudiment of the future fruit. But the science of Botany We make no apology for this dry discussion, our aim is perspicuity rather than elegance. We wish to give the ~~popul~~ student of Nature a less confused idea of a flower than he can find in books, The aim & end of these essays is to give the young botanist a clear & distinct idea of the complicated thing before us.

Since

Since the adoption of the sexual system, the petals ~~are~~ that excite attract the ~~eyes~~ admiration of the florist, are considered only as coverings to the essential parts of the flower. A flower therefore, in modern botany differs from the same term in former writers, and from the common acceptation of it; for the ~~petals, the~~ calyx, the petals, nay the filaments of the stamina, may all be wanting and yet it is a flower provided the anthers & stigma can be traced. The essence of a flower then consists in the anthera & the stigma, and they ~~consist~~ constitute a flower whether they be supported by a calyx, or surrounded by a petal or petals forming that chaplet, or little crown denominated in latin corolla. A patient observer may find these nice distinctions illustrated in ferns, mosses, mushrooms, lichens, & sea weeds. Let us now examine a compleat flower and ~~first of~~ let us first look at

The Calyx; which originally meant the green bottom of a rose-bud rotfully blown; but is now extended to that green-flower-cup which inclozes & supports the Corolla or painted ~~flowers~~ petals of every flower. The admirable Grew called it "the empalement"; and defines it to be the outmost part of the flower encompassing the other two, namely the Corolla, or what Grew called "the foliature"; and the stamina & pistillum which he called "the attire".

The terms perianthum, involucrum, amentum, spatha, gluma, calyptra and volva, are but different appellations of the varied calyx. Linnæus tells us that the calyx is the termination of the cortical epidermis, or outer bark of the plant, which, after accompanying the trunk or stem, through all its branches, breaks out at the bottom of the flower in the form of the flower-cup In the sexual system, or, as some will have it, the allegory of this illustra

illustrious naturalist, the calyx is called the <u>thalamus floris</u>.
The calyx is rarely one entire piece, but of several, one laid over another: this structure serves to keep the whole flower tight, and at the same time allows it to recede as the parts of fructification encrease in size. It is like slackening the laces of the stays, stomachers or bodices, in cases and circumstances not entirely dissimilar.—*
Flowers standing on a firm basis, as tulips, have no calyx. But where the foot of each petal is long, ~~as in pinks~~, slender & numerous, as in pinks, there they are kept ~~from~~ within compass by a double calyx. In a few instances the calyx is tinctured with a different colour than green, & then it is not easy to distinguish the painted calyx from the painted corolla. Linnaeus however, gives this simple rule for distinguishing the corolla from the calyx;— the former in point of situation is ranged <u>alternately</u> with the stamina; whereas the segments of the calyx stand <u>opposite</u> to the stamina. Thus much for the calyx.

The <u>Corolla</u> is the circle of beautiful coloured leaves which stand within the calyx, forming a chaplet composed of petal or petals; for so we call those delicately painted leaves, which excel in beauty every other part of the plant.* In the piony they are blood-red; in our garden Lilly, a rich and delicate white, and in tulips & violets charmingly variegated. The number of petals in a flower is to be reckoned from the base of the corolla; and the number of the segments from the middle of it. If the petals are quite distinct at the bottom, the flower

† The Science of Botany was unknown to the ancients. They had no distinct terms to express the petals of a flower, so as to distinguish them from the segments of the calyx, or the nectaries of the plants, &c. p. 4. Linnaeus

* The <u>Artichoke</u> affords a good example of the calyx.

flower is said to be polypetalous, or to consist of more petals than one; but if the petals are united a bottom, though ever so slightly, then the flower is monopetalous, or consists of one petal only; thus the cranberry is monopetalous and not tetrapetalous, because, though the petals fall off in four distinct parts, they were originally united at the base.* The number five is most remarkably predominant in the petals of flowers. A bellshaped flower consists of one petal and is denominated corolla campannlata, and a funnel shaped flower corolla infundibuliformis; a gaping flower corolla ringens; but the corolla cruciformis consists of four petals, and the butterfly shaped flower, or corolla papilionacea consists of five petals, as in the pea blossom. The number five is most remarkably predominant in the petals of flowers.

There are moreover irregular flowers, consisting of dissimilar parts, which are generally accompanied with a nectarium, as in the larkspur. The nectarium, so called from nectar, the fabled drink of the Gods, is that part or appendage of the petals appropriated for containing the honey, whence it is taken by the bees. All flowers are not provided with this receptacle for honey, and the irregularity of its form and situation frequently puzzles the young botanist. Sometimes the nectarium makes part of the calyx; sometimes it is seated upon the anthera, and sometimes it is fixed in the common receptacle. Plants in which the nectaria are distinct from the petals, that is not lodged within their substance are generally poisonous†.

Stamina

*Philos. Botan. †ibid

Stamina & Pistilla.

Within the corolla stands, what Grew called the attire; but what is now called the stamens & pistils, which in the ~~Linnean~~ Linnean sexual system, and hypothesis of generation, are the most im-portant organs of a plant; for on the number & respective posi-tion of the stamins & pistils ~~Linnaeus~~ the Prince of Botanists has founded his famous sexual system.

The Stamina are filaments or threads issuing from about the middle of the flower. Each stamen or thread is surmounted by a prominence or button containing a fine powder. This protuberance is called the anthera, which is a capsule with one or two, or more cavities. See Grews graphic descriptions from plate 55 to 64 inclusive, where these capsules with their pollen or fecundating powder are finely delineated.

anthera The Pistillum, which is the latin word for a pestle, stands in the centre of the flower; ~~and~~ this term has been adopted from the fancied resemblance of a pestle in a mortar. The pistillum is placed on the germen or ~~seed-vessel~~ seed bud; its summit is called stigma, and in many flowers resembles that bone of the arm called the os humeri; but its form varies in different kind of flowers. The surface of the stigma is covered with a glutinous matter, to which the pollen, or fecundating powder adheres.

The Germen is then the base of the pistillum, and contains the rudiments of the seed, which in the process of vegetation swells and becomes the seed vessel. It answers to the ovarium, or rather uterine apparatus of animals. The pericarpium is the germen grown to maturity; or the plant big with seed:

The Receptacle is the base which connects all the six before mentioned parts together. (Fructification.)

The

the summits of the stamina, are called, by way of preeminence, anthers, or flowers. They contain the pollen, wc. means in latin, the very fine dust in a mill. Some conceive this dust to be infinitesimally small seeds or eggs; others compare it to the seminal fluid in animals. It is very conspicuous in the tall white garden lilly. This powder is col-lected by the bees, and is formed, by some secret process in their bodies into wax, which is a singular species of vegetable oil, rendered con-crete by a peculiar acid. J.

Having described the seven component parts, of that curious offspring of a plant denominated a flower, we have now leisure to make a few observations on the whole composition. Assuredly, there are few productions of nature that delight the eye equal to ~~some flowers~~ a com-pleat flower. Some of them far exceed the finest feathers, the most brilliant shells, or the most costly precious stones & diamonds; and this appears to have been the judgement of the learned & tasteful in all ages; for the term flower has always been used to express the most excellent ~~by~~ valuable part of ~~any~~ a thing: it is synonymous with ornament, or embellishment & perfection; it is used to express the prime or acme of an individual in the animal creation; and also that which is most distinguished for any ~~thing~~ very valuable acquirement, as the flower of the army &c. as the flower of chivalry. The richness & splendor of the greatest of kings fades when compared with what Milton calls "the bright consummate flower", for we are told by the highest authority that ever appeared in this world, that Solomon in "all his glory was not arrayed like one of these."

The lilies of the valley, they toil not neither do they spin

I cannot readily believe that the corolla has no other use in the vegetable oeconomy than merely to cover & guard the sexual organs; for we actually find that there is a pulmonary, or breath-ing system to every petal. There is an artery belonging to each, which conveys the vegetable blood to the extremities of the petal, exposing it to the light & air under a delicate moist mem-brane, which covers the internal surface of the petal, where it often changes its colour, as is beautifully seen in some party coloured poppies ‡. The vegetable blood is collected at the extremities of the what Darwin calls the corall arteries, and returned by correspondent veins, exactly as in the green foliage and that for the importance purpose of the sustenance of the anthers & stigma; and likewise for the secretion of honey wax & essential oil; and for perfecting the pollen or pro-lific powder. The ingenious author of the Phytologia & the botanic garden ~~is~~ thinks, that as the glands which produce the prolific dust of the anthers, the honey, wax and odoriferous essential oil, are generally attached to the petal, and always fall off and perish with it, it is evident that the vegetable blood is elaborated, or oxygenated in this pulmonary system of the flower, for the purposes of these important secretions ✱. We should bear in mind also, that as the green leaves constitute the organs of respiration to the leafbuds, so the bracteas perform the same office to the flower buds.

‡ See Darwin's Phytologia. ✱ Ord

after

After the corolla, stamens, stigmas & nectaries fall off, the flowerbud becomes a vegetable uterus, for the purpose of supplying the growing embryos with nourishment. It possesses, says Darwin a system of absorbent vessels, which brings the sap to the foot stalk of the fruit, and which there changes into a pulmonary artery, which constitutes the bractes or floral leaves, and exposes the acquired juices to the oxygenation of the air; and it is presumed converts them into perfect vegetable blood: this blood is collected again by the veins of the bractes, & conveyed by an adapted vessel for the various secretions of saccharine, farinaceous, or accident materials, and for the nourishment of the included embryos.* In contemplating an humble plant or a lofty tree we should bear in mind the inosculation of all its vessels; that such an inosculation actually exists is evinced by the encreased growth of one bud, or one fruit when others in the vicinity are cut away.

(Linnaeus Philosophia Botanica) Vide Lee

"the bright consummate flower,—spirits odorous breathes."

Plants especially flowers have a remarkable odour, most of them very agreeable to the smell. This odour depends on their oil; but the oil they contain is of two sorts, the one fixed & the other volatile. The fixed oils is found only in the seeds, & is confined almost entirely to those which have two cotyledons, as flax seed, almonds, & rape seed; but the volatile oils are found in every part of the plants except the cotyledons of the seeds, where they never occur.† The peculiar odour of a plant is owing to the a volatile oil.

When we say that the fine odour of a flower depends on its volatile oil, ~~we go not quite far enough~~, or that its aromatic virtue is contained in its essential oil we go not quite far enough. This essential oil contains something more subtle & active than itself, being an exceedingly minute

* Phytologia. †. See Thompson's Chemistry

active volatile and scarcely ponderable spirit, which when se-
-perated leaves nothing particular in the oil. This is the spiritus
rector of the old chemists, the prevailing or ruling spirit of the
vegetable. This spirit which is inimitable by art, imparts that
smell & taste to ~~a plant~~ every individual plant, which is pecu-
-liar to it and to be found in no other. It appears then that the
peculiar taste & smell of plants wholly reside in their native
spirit; that essential oils have their respective characteristics
from these spirits alone; that the volatile oil of plants princi-
-pally serves for invelloping & detaining these spirits, while
the fixed oil serves only for connecting the solid parts to-
-gether; whence the difference of these two oils is very
wide.

Should any one object to the vague term of spirit, we
would remind him that spirit in the german language
is gaz, whence was derived our english word ghost or
a spirit. The name of spirit was formerly given to any
subtle volatile substances i.e. exhale from bodies in
a given degree of heat; and by a sort of imaginary analogy
transferred to our own bodies; hence the term animal
spirits, which was supposed to reside in the nervous
fluid as the spiritus rector resides in the essential oil
of plants.

If the term spirit, or spiritus rector should displease the fas-
-tidious critic, we offer him that of quinte ssence in its stead.
By quinte ssence we mean, we ~~mean~~ the specific essence

many salts — also Locke

See Stahl on

the active principle, by the power of which medicines operate. Tis the distinguishing part of medicinal simples which can be in imagination seperated, from the tangible body and leave leaving its organization entire. To be more particular — the ancient philosophers and the old chemists conceived that fire, air, water & earth contributed to the composition of all vegetable bodies, to which was added a fifth thing or ens, which enriched & distinguished the whole by its own particular virtue, and on which the odour, taste and virtue of each body depends. They therefore supposed that each particular thing consisted of the four common elements or essences to which was added a fifth, which though small in quantity, was very powerful in efficacy and predominant, and this they called the fifth element quinta essentia, or quintessence of a thing. The knowledge of quintessences was considered 300 years ago, as the utmost bounds of chemical perfection. Is not this precisely the case at present with the knowledge of gases, or spirits?

If there doubtless is in vegetables as in animals, a subtle structure too fine for our senses. There may be intermediates between pure immaterial spirit & gross matter, and this intermediate material substance may make the cement between the human soul & body, & may be the instrument, or medium of all its actions & functions, where material organs are not manifest" (Cheyne's Malady)

The science of Botany was unknown to the ancients. They had no distinct term to express the petals of the flower, so as to distinguish it from the green leaves of the plant. Virgil in describing his Amellus, a species of aster, the flower of which has a yellow middle & purple rays, calls it a golden flower surrounded with purple leaves. All his translators excepting Martyn the botanist have mistook his description.

Aureus ipse [flos] sed in foliis, quæ plurima circum
Fundatur, violæ sublucet purpura nigræ. Georg. IV.

See Lee's botan. p. 4.

His probable that every plant has a nectarium, tho not visible, that is a gland that secretes honey — Rosp.

In considering a whole daisy as one flower, we give it a very significant name when we call it a compound flower. To avoid all ambiguity with regard to the word flower we shall restrain it to the compound flower and give the name of floscules or florets to the little component flowers. but in the midst of this verbal precision let us not forget that each of these florets is a genuine flower. (Rospean's letters, p. 84)

A purple head of clover is not a compound flower but an aggregate or capitate flower for its florets are not set on one common calyx like the daisy.

Passion flower Rosp. p. 423. Alexandrian Laurel. p. 402.

In this succession you will see a chain of wonders wc will keep every sensible mind that observes them in a continual admiration. Rospean. Fungi — dregs of vegetable nature. Ird —

The Carnation is a worthy leader of the finest natural orders. When we consider the size of the size of the flower, the beauty of its colours, the singularly rich & spicy odour that it exhales &c. we cannot withhold that tribute of admiration wc will ever be given it, unless by obtruding itself too frequently on the eye, its real beauties become at length disregarded. (Rospean)

The Cactus grandiflorus, the most magnificent flower, during its that appearance that grows. See Rospean p 287 — !! —

+ The rose, were it less known, would hold the first rank in the admiration of mankind ib. 293.

Magnolia ib. p. 300

× might blow. Ceres.