1814

Rules & Regulations.

Radix.

April 20th 1774.

Linnæus commences his delineation Plantarum with the root and describes their varieties in forma, duration and direction.

In forma secundum Durationem

The duration of the Rootmost be as various as that of Plants, but they may naturally and usefully be divided into the annual, the biennial and the Perennial.

The Annual marked with a sun thus ☼ are very numerous. The spring from the seed in the Spring and in the summer ~~the~~ and autumn flower and bear fruit, ~~lett~~ die and decay and become nutriment for others on the Returns.

Like the gay butterfly they grow in the spring and appear in their gaudies attire only to deposite their eggs for the perpetuity of the species, they shed their glowing colours and sink again into the bosom of their mother earth yield to her what they have rec^d. the moulder alike and the changefull organic matter is wrought again in gaudy butterflies & beautiful flowers.

Among the annual plants we shall enumerate those which are most useful to man as the <u>cereals</u>, those which he has rec^d from the bountiful hand of Ceres, and which the guards with maternal care, and delights to

the entrails in the crown. The Indian corn you all know is annually planted and annually dies. Never have I heard an instance of its surviving the ~~the~~ after the winter blasts. Wheat (Helianthus Frictiferum) sometimes survives ~~over~~ these seasons. So does the Tobacco (Nicotiana Tobaccum) and in all probability would become perennial if care was taken. Rye (Secale cereale) (oryza sativa) rice, the Helianthus Annuus. Sun flower. (Avena Pensylvanica & fatua) two species of oat are annual, others perennial. By cultivation annual plants may become biennial and even perennial

Biennials. Biennial marked thus ♂ exist most always for one two year only. This class is numerous but far less so than the ☉ & ♃. but families examples are before us in the (Daucus carota) carrot. (Beta) Beet. (Pistanica) parsnip - turnip potatoe. Many of the grasses. the (Trifolium pratense) or clover, which is not a grass sometimes remains three years. Some of these plants will outlive the changing seasons, and sometimes become perennial. This plants dies to the roots, winter and sprout again.

Perennial plants are such live longer that two years and is thus marked ♃ and is also called [illegible], from [illegible]

a stunt but and proper ~~Sp~~ ause
they are sometimes herbaceous or
dye down to the root annually
and of course are not ligneous
and produce no buds. Such is
the very common plant the
(Allium Cepa) Onion. The rumex
sanguinea. These plants have
also been divided into persisting
and fugitive. The persis they are
such are are herbaceous or die
to the root annually & spring
up again the next spring. but
do not usually live very long
such as the onion the Rumex San-
The distinction is very obvious &
necessary - the persisting is marked
thus ♃ and the include a most
numerous collection of plants -

the beautiful magnolia, so common about this city, the Juncus or Rush almost all the violets. and many of the curious and striking Natural order of Gramina or Grasses the Sugar Cane (Saccharum Officinarum). the triticum repens.

The fruticosa marked ♄. thus includes such as are called shrubs or trees examples of which need hardly be mentioned, it will comprehend the castanea alnotanum and the magnificent Lorrio. Tulip &c. Shrubs and trees are not distinct because what is a shrub here will be a tree in other climates thus the Castanea chincopin is a mere shrub in this latitude but as a large tree on the banks of the magestic Miss. Illinois.

By climate & soil great changes are produced. Thus the Ricinus communis is Perennial in Brazil and becomes ligneous & is a large tree but in Carolina it and become ligneous & perishes annually in Georgia according to Mr Piper he has seen it N. Hence is simply herbaceous & annual. Undoubtedly many plants have become Perennial from accident & culture, and it produces that it is not absolutely precise period for plants to live. The final cause of the existence of a Plant and the end of its being seems to be the propagation of the species and when this is attained it dies, as is manifestly the case with the annuals.

The season is not sufficient to perfect the biennials, and the herb sprouts from the seed and flourishes obtaining nutriment from the air & the ground. This nutriment is to be expended the next season in perfecting the seed. A proportion is taken upon the root as in the Carrot beet &c. In the Spring following it puts forth its leaves and the root is impoverished by the luxuriance of the Plant. In the persisting plants we see the same excepting that the roots seem to imbibe nutriment and prepare it for some years — but some perhaps all of them produce a new root or part of a root every

year. This is the case with the Lan-
guinaria canadensis / Puccoon and
the Veratrum Luteum Hellebore
and the Cypripedium hyemale. The
Cypripedium is most obvious. The
bulbous root of which gives out a
bud or perhaps a radicle which
grows into a bulb and no doubt
is supported by the older one until
it can put out its roots and supports
itself. After the flowering of the plant
the perfect bulb becomes lighter and the
other flavisches at a little distance
from the ~~other~~ former one. This bulb
the next summer produces a similar
bulb and itself dies. This proves my
position that they are the hybernacle
or winter quarters of the vegetative
ons or being and that they produce
a new part or root. In correctness we
would doubt whether there was a perennial

and we are not certain that anyone makes it so, but the others the Pueccoon are persisting and in a very curious way. No doubt all the premorse roots are similar in the migration and in the method of effectually securing a progeny. The Veratrum ~~album~~ album — if examined will present a short horizontal root, somewhat bulbous with radicules shooting from the base in two rows one on each side. The part from which the plant comes will be found round full white and the radicles smaller upon it. The glumy chaffy leaves will be found burst from one side as if forced of by the growth of the plant. The other end is praemorse or as if bitten off. and many dryed leaves & radicules showing that that was

root of the last year, and you may also see the effort to throw out the little roots from the swollen end in order to become a root in hidden place for the vegetable living during the winter. Thus the plant seem travelling slowly forward upon its leg like roots. One end wither dies, becomes poisonous as the other grows. Follow the slow movement of the Poccoon and you will see that the plant is not properly perennial for it make and annual effort to produce a new root, from which arise another plant, while the old one irrecoverable fade withers & dies.

~~For the best of reasons~~

The Perennial plants have a root remain a long time and the blanches become a

winter quarter for the numerous
beings for buds, which live from one root
or one source. The final cause
then of Plants existing more than
one year is to have up nutriment
and strength to produce seed.

We have perhaps digressed
Let us then now consider Plants
Secundum Figuram according
to their form Commencing with
the most simple. It will therefore
not be improper to say that some
plants have no root. as the Fungi
and some are very imperfect.
Thus the fungi are mere rounded
terminations. Most plants have
however obvious roots

The most simple Roots is the
Radix fibrosa consisting of fibrose
radicles without any main root -

I am disposed to doubt whether really there are any truely fibrous roots. The grasses have fibrous root but they have a caudex descendens resembling the fusiformed root soon to be mentioned. The Aristolochia serpentaria has a main root from which many small radicles pass, and precisely so is it with the Valeriana officinalis. Those which have a fibrous root arising from the bulb or knob are called capillacea. hair like. Either fibrous or capillacea may be applied to numerous plants which have a distinct caudex & radicula.

~~The Rhizoma is a root so many branched~~

The fibrous Root is also applied to all slender roots. The anemone and trees & shrubs

according to Dr Barton the Jef-
ferson's bifida or dyphilla has
the radix ramosissima

The radix fusiformis comes
next. It pushes perpendicularly down
ward perpendicularly and is large
at the surface of the ground and
tapers to a point gradually. This
root is fine illustrated in the
Parsnep (P.) Beet (P. V & Al) and
beautifully in the, radish (Raphanus
sativus). I with Due deference
to Dr Barton's opinion I consider
the (turnep) Brassica rapa) and
the turnep radishes and their
varieties in form as tap or
spindle roots, presuming that
they were originally so. because
we find them in all the inter-
mediate grades of figure. Dr Barton
says the first edition of his elements,

Pramorse Root. Viola

Cholera Morbus

Sydenh p.140 } To expel the humours which feed this disease by purgatives is to attempt to extinguish fire with oil, equally absurd

of Botany that the spindle-shaped was frequently changed into the round knobbed, or tuberous root by cultivation. The umbelliferous plants are examples of this form of the Rt. the radicles shoot out from the sides of the root variously, but without eyes or buds as in the potatoe. Examples —

The Premodes we have already mentioned. On account of it growing from one part it dies at the other and by a process something like of not absorption it appears as if bitten of hence its name. frequently this plant it called Devils bit. The Sanguinaria Canadensis

The radix tuberosa is a round knobbed root. It differs from the bulbous root in not having an embryon to which all the other parts conform. The potatoe is a tuber. It has eyes but the substance is not arranged in concentric circles & appears not to have any relation to the embryon. Examine the bulb & again we find one point to which all refer, expecting perhaps a few smaller ones which are smaller bulbs. In the potatoe no sap vessels can be traced to the eye. It seems a repository of matter for the nourishment of the plant that will spring with from it. In many plants we find but one tuber as the Helianthus, and numerous as in the (Sol: Tub:). The granulated seems only to be the tuberous of a small kind.

veratrum luteum. Valerian
and Plantago & R

The next genus is much allied
to the last particularly if you
believe what I have been before men-
tioned concerning manner of their
growth & reproduction. The differ
ence is this called the repent R
runs just under the surface of
the ground and gives off buds or
shoots here and there examples
of this may be seen in some
grasses and if I mistake not in the
clover (trifolium pratense)

Fasciculated Radix is when
a number of fleshy roots come from
the same base directly

The Palmata is in a fleshy Rx
somewhat like the hand in shape
as in the orchis spectabilis.

Next we enumerate the granulated root as in the satifrage and the Trifolium Pratense consisting of fibrous roots having a small number of ~~granulated~~ small knobs attached to them, Numerous tubercles

Next and last we should according to L illustrate the Radix Bulbus ~~as~~ We have sometimes doubted the propriety of calling this a root, but as it is buried in the ground & is the receptacle or store house of the succeeding plant, it is properly here as it should be. Does it a mere envelope like the bud, for entry on plant then would we not hesitate to place it among the buds, but much nutriment is derived from it by the rising plant. It is nearly round and various in appearance each diff^y designated

Asthma

D'Millan. Bleeding is often hurtfull by reason of its relaxing too much — Julepum e Camphora often procures immediate ease in the paroxysms a table Spoonfull every 3 or 4 hours p. 104 —

The herbs dies down to the bulb annually and an embryon is formed about midsummer ~~and be~~ which by the warmth of the succeeding Spring ~~parts~~ from this Hybernaculum or winter quaters and flowers. at this period, the in the full vigor of the plant another embryon is formed, for another year.

The bulbous roots are of various kinds. the all obtain nutriment from radicles and from a central pore opsite to the Punctum scheen. The bulb itself absorbs not

Linnæus makes four kinds B. squamosus. R solidus. B truncatus and B articulatus — B duplicatus.

1st. The Bulbus duplicatus a double bulb. The daffodil a species gives an example, but the Cypripedium hyemalis is the example cited by Dr Barton. One bulb attached to the plant and this solid and heavy but — the other is empty & is only attached to the sound bulb by a root — Hence the bulb of the last year which put forth its pliable leaf and flower & shot out a root which became a new bulb & perished itself. In this case I will whether the bulb should be called Double, but only because the old bulb has slowly yielded its vitality & resisted decomposition

How this observation may apply to others we will not pretend to say as we have not seen examples.

2d The Bulbus articulatus consists of a number of bulbs linked or chained together. We have neither seen this ~~species~~ variety in nature nor delineated by engraving.

3d. The bulbus solidus has a doubtful existence according to Dr Barton, but we have not doubt but that Linnaeus meant such bulbs as appear solid and were difficultly seperated according to the tunics. We think we may assert that the tunicated, and the solid as sufficiently distinct to found specific characters upon, and by no rule can we then conceive that the solid bulb should not be considered even a variety;

The tulips is an example, also the Crocus

4th. The bulbus Tunicatus is the most common of curious. It consists of concentric leaves rolled together one over the other diminishing in size toward the centre until we come to the embryon near the centre. The common onion may be easily seperated into tunics or coats. Examine the beautiful Amaryllis formosissima & the same will be the disposition of parts. That this kind of bulb ~~which~~ and the next should be called root is well proved ~~that~~ by the fact that these plants will grow without moisture or being placed in the earth. Sometimes also the root will fall off from the Hyacinthus Monstrosus, as it flowers in the glass. The reason of this is

plain. The roots will imbibe to much nourishing nutriment is deposited in sufficient quantities and only requires moisture to render it fit for nutrition and heat to set the ~~[illegible]~~ vegetable machine in motion. The Roots fall and by experiment an ingenious man moisture is absorbed by the centre pores, I say moisture for I do not suppose any thing else is by it absorbed. The Radicles would not have fallen from it was it growing in the earth.

5thly The Bulbus Imbricatus, is composed of seperate lamellae, laying over each other like the tiling of the roof of the house. It is also called squarrose & squamose The Lilies was exemplify this kind. They are not inaptly compared with the cone of the Pines —

Beautiful examples of the Radix Horizondis may be found in the Convallaria Racemosa & Bin the anemone Nemerosa. The viola is a praemorse horizonal migrating Root.

Having spoken of the Figure and the duration of Root we shall not ~~mention~~ consider their

Direction

Direction.

Most roots run perpendicularly downwards upwards we need only mention most trees, vegetables. This is the Radix perpendicularis.

Obly When the root strikes but a short distance into the earth and the runs off ~~horizontally~~ parallel with the surface and giving off radicles on all sides. This is called horizontal the May apple, Podophillum Peltatum and the Smilax Sassaparilla are fine examples. This appears to be only a perennial in these plants preserve the root, the Root remains and is not absorbed

so as to appear abrupt. The axis which is called horizontal is praemorse — many plant push down their roots perpendicularly and other postrudee horizontally as the trees generally ~~exceedly~~ The poplar and the Robinia Pseudo acacia ~~are~~ perhaps seldom descend.

The repent root may not properly be considered here because it refer little to its direction, It's called thus when it runs out a distance in any direction and puts forth radicles from space to space, — The mint — Mentha Piperita

We will next speak of their use and make other observations The Root of most plants is in the ground but some plant, but the Fucus natans the Fuci the Gulfh weed and the

Lemna or duck weed floats with thus roots in the water. The tremella and some of the Fucii ~~are~~ are said to want roots.

Many of the proper Lichens do are parasitic and attach them-selves to the bark of trees and to rocks rotten, wood.

Some species of plants attach themselves to some species of stone and seem to draw nutriment from them because the radicles are found in little depressions, ~~and the~~ as the Lichen calcareous, and ~~as~~ it contains a large portion of Lime. But they may only adhere, and are adventitious by nourished, by whatever is washed or blown to them

The Misletoe (Viscum) and the Tillandsia usneoides adhere to trees and absorb ~~in~~ nutriment

from the bark the sordes around the bark and even inosculate with the vessel of the stock. The Dodder which is so common here & in New England sends prongs from the ground and clings to neighbouring plants & even the root decays but depends upon some other source. Frequently have I seen it clinging to dead stalks and to withered leaves, which were evidently killed either by the absorbing power of the parasite or like the animal called a tick drains the stock which gives it support and life.

The uses of the Root are several first and principally to absorb nutriment from ground or whatever they are placed in. They are truly absorbent. It is only the Radicles that possess this function and this is no doubt also confined to

the conical termination of the radicle
the descending caudex has not other
use than conveying the juices quick
ly the radicles and give a firmness
to the plant by holding it securely
in the ground. Some roots have
another use which has already been
hinted at. In biennials sufficient
strength and mucilaginous matter
is collected in one season and stored
in the root as the Turnip. the parsnip.
to afford it opportunity to produce
& perfect its seed the next season. The potatoe has
buds or eyes which are so connected
with the organization of the solid
part so that the vegetative matter
the stored becomes the first food
of the infantile plant the next
Spring. The bulbous root is an
Imperfect of the plant. It is may
be discovered the embryon plant

about mid Summer before the Spring in which it appears. as any one may prove by examining the Vegetable at that period. It uses to man and the animals subordinate to him need scarcely be hunted. medicinal qualities reside frequently in the Root and in no other part of the vegetable.

The Root consist of the same Parts as the trunk. 1st the Medulla 2d. the Lignum or wood 3d the Alburnum or sap Wood. 4th Liber 5th Cortex & 6th the Cuticle or Epidermis & 7th. the Silver grain. In the lignum and Liber run the sap vessels and spiral vessels. This structure we will here after treat more fully. when speaking

of the trunce & its structures.

of the Herba —
define —

The 4 parts.

Define.

Daucus. Car.. Pastinac. Hyber: Hyeas. col: g
nutri.t sec.d the nut. rises in the Herba —
expands in the leaf — blows in the flower — & is
exhausted from the root.

Herba.

Having considered the Root ~~&c~~ its varieties and the uses we meet in following Linnaeus proceed to the Herba or Herb by this we mean all the part of a plant which is above ground excepting the flower.

The Herba ~~consists of the Trunk~~ comprehends four varieties 1st The Trunk, 2d the Leaves, 3d Fulcra, 4th Hydrometeors.

The trunk need hardly be mentioned. It supports the Leaves and other parts in most plants.—

The Leaves you all know but the Fulcra or props are not commonly noticed. They are various the cirrhi or tendrils are examples. Spines or thorns and hairs. &c &c —

The Hybernacula or hybernaculus are the buds and the Bulbous Roots ~~which~~ They protect the embryon plants or vegetable ens which is formed in the vigor of the Plant ~~from~~ in Summer from the succeeding frost & Winter.

Truncus.

6 The truncus or trunk is that which bears the leaves or fructification. I will not say leaves & fructification because in many plants we have a trunk or stems as in the Aristalochia Serpentaria ~~the stem rises out from the Root & the leaf stem & leaves~~ bearing the leaves only while the flower shoots from the root ~~seperate from the other~~ shoots under ground. Beside the scape never bear a leaves.

Of the trunk botanists enumerate seven Kinds 1st The Caulis, 2 Culmus. 3d. Scapus 4th Pedunculus. 5th Petiolus 6th Frons. and 7 Stipes —

1st of the Caulis —

This is the most common and includes the greatest variety and is defined to be the trunk or stem which elevates the leaves & fructification. The Caulis or stem is divided into to two the simple and the Compound. Some plants run up into a stem without any branches. Here any one would infer were simple, but some plants have branches & in dividing do not lose the appearance of the main stem, but when they do as in they are called compound

See Smith – Caulis Radicans. Scandens.

Flagelliformis — Prolifer –

Facts proving the perceptivity of plants, with regard to the voluble stems

Of the simple stems some are entire, naked, or destitute of leaves, erect or ~~prostrate~~ procumbent other are Volubile. The caulis Volubilis is one of the most remarkable and worthy of notice. They ascend spirally generally twining about some other also and they grow either to the right ~~or the left~~ as the Humulus or Hop and the Lonicera or honey suckle, which is according to the Suns motion. Or they turn to the left contrary to the apparent motion of the Sun as the Convolvulus & the Phaseolus or bean.

The Sarmentose stem may be seen in the Fragaria Vesca or strawberry pushing out horizontally without leaves and finally protruding radicles, or putting forth ~~its~~ leaves. The young plant thus produced

Tuttle Geraneum. Sax. Sar-a

thrives awhile by the aid of its parent
untill it gains root sufficient to
support itself. then the Sarmentum
dies and the communication is
cut off — The Saxifraga Sarmentosa
presents a beautiful example.

Linnaeus we have said considers
the stem as the ascending caudex —
and ~~the~~ prove the roots & branches similar but inverting a tree and showing
the the stem will become roots &
the root put forth leaves & flowers —
Bury the sarmentum of the strawberry
and it become a root and as the
sarmentum run on aside and
put forth roots and leaves it is
the repent caudex ascendens. or
repent creeping root above ground

The caulis may be teretes or tapering
and cylindrical. ancipites or double edged
two opposite angles — & sometimes 1. 2 3 4 &
5 angles. Sulcate or furrowed. Striate

They compare the crown of Ceres, who is by the ancients fable represented to be the Goddess of Corn or rather of grain. She supports a cornu copia filled with delicious fruits. On her head she wears a wreath of the Barley, rye, wheat oats & the various grasses entwined together.

or streaked. Yellow flowers, Glabrous same: many be very ramosissimi —

The next species of stem will fall under the caulis, according to the definition, but yet it is so distinct that with peculiar propriety is it made a separate species and called Culmus. It is very hard nice equally hollow, jointed and Ureinmark able for the long slender uniformed or sword shaped leaves, usually with vaginant petioles and it supports a fructification which is unlike every other that all the Systems makers who have attempted to arrange plants according to their resemblance have thrown them together and they almost all fall under Linnaeus's artificial order Triandria. They are called Gramina in his Nat. Order. Monson calls them Culmiferae. Ray in his first system demonstrates them Gramina.

* They are the grasses. wheat, rye barley & Zea Mays is an excellent example

you may see at Hamilton & Watts another ~~example~~ excellent example in one of the most important plants which is cultivated by men, the product of which, to mankind would be almost as great as that of breadstuff. you doubtless anticipate my meaning.

and as there are very few ladies who have not worn straw bonnets few should forget that the part used in Bonnet making ~~nothing~~ is that species of bark or stem denominated ~~Culmis~~ Culmus. In New England, the country girls are employed from morn till night in cutting and splitting straw and then in braiding with wonderful dexterity. Nothing standing this dexterity, the trouble & time for making one bonnet is almost incredible. To cut, split & clean the straw & thin blade, press whiten and sew it into the form of a bonnet taking the lowest prices for the materials for labour & living will by a calculation made by myself amount more than $10.

the plants in the Saccharum Officinarum, sugarcane the Nattas (* Arundo Bambos or Bambos, fish pole &c — you will do wise to recollect this species of stem because you may with certainty associate a number of others with it as having common Botanical appearance, uses & management. You all know this stem by the name of straw. * It has few varieties Culmus articulatus. jointed Grasses. cane &c — corn stalk. some are without knots & then denominated enodis culmis. The space between the knotts is called Internodium & the joint articulus culmi. In India many of the culms are branched. but few are here — Some a naked or distitute of leaves, when they very much resemble the next species of stem.

In the joints of some reeds in South America exist the Jabasha a silicious secretion, from the plant

The scouring rush (Equisetum) has a silex or flint in the cuticle, hence its use in scouring pewter and polishing metals. &c. The flint may hence in the root and in the root have been taken up by the plants & deposited in the cuticle, being dissolved in the potash which every plant has, potash dissolves silex. In this state it or it may be formed out of its constituents and make silex by a vegetable process. This perhaps may surprise you but I have imbibed an idea which I think Dr Thomson the English Chemist advance that plants had the power of forming iron, ~~&c~~ the ~~[illegible]~~ and not have supposed ~~fail~~ of nothing, but ~~from~~ in the elements or constituents of the plant itself. Thus I suppose the silex is produced by a combining power of the vessels of the plant. This is hypothesis, and perhaps absurd, I consider it conjectural

Naked - - scally in Tufsilago Farfara -

* This plants was called Narcissus Poeticus. from Narcissus who is fabled by the Poets to have been the son of Rivers Cephisus. He, who was that account pined away until she became slighted the courtship of Echo and finally died nothing but a voice. of Love for himself having accidentally seen his own image reflected from the smooth river. Others say that he was so delighted with his own beauty, as seen in the river, that he stood gazing at his own fine face so long that his feet became the candex, his fingers into radicles, his arms into leaves, and his head became the flower of the Narcissus which has ever since bent down as he was as if looking steadfastly upon the ground

The Scapus is that stem which bears the fructification, but not the leaves. elegant examples may be seen in the Primula Vericula & the Leontodon Taraxacum (the Dandelyon) the Viola (or Violet) canal: magalis. The leaves all arise from the ground and so does the stem. Another familiar example you see in Hyacinthus Muscari of blue bell and the Hyacynthus monstrosus of common hyacynth.

* Narcissus Poeticus or Daffodil —

If a plant has no radical leaves and the stem is without them or is provided with scales only it is not considered a scape but a caulis. The Scapus may be 1. 2. 3 or 4 or more flowered.

The Frons is a species of stem

circinal: which bears stem or leaf as in the Felices of Ferns — explain —

The Stipes is used to express the stem of the mushrooms and the

main stem of the Trees is a stipe.

Linnaeus has enumerated two other stems or varieties of trunk, which Dr Baster hinted this season were not properly so. This idea is correct. A trunk is that part of the plant which arises from the root and seems to be a direct continuation of the ascending caudex as in the cherry tree. Altho it branches much, yet any one would yet say that the structure was the same. But the fast stalk of the cherry itself is very different. The trunk is general, while the fast stalk of the cherry flower belongs to the flower. decays annually. With equal propriety the flower would be considered a peculiar stem of the leaf, for in them Linnaeus asserts may be found the same structure & same number of parts.

Altho' we are fully of the opinion that they should not be considered as stems or trunks we shall here demonstrate them elsewhere as they are very important parts and serve for ~~generic~~ & specific characters.

The 1st is called Pedunculus or P. and is the foot stalk of the fructification but not leaves. The stalk which bears the flower of the cherry from the stem is an example, so is the Hyacintho the latter stalk connecting the flowers to the main stem are peduncules

Linnaeus makes a pedunculus radicalis which will be strictly a scape. Linnaeus was a man of such precision that I should not have used a word so inaptly & forbidden

he must therefore have had some thing in view. Some plants push up their stem and the flower came up separately as in Aristolochia serpentaria. Virg.: snakroot. It is true that the pedunculle comes off from the stem which rises into the air and but the pedunculus is always given of under ground as in some others of the Nat.l order of Linnaeus Sarmentoceæ as the Asarum Canadense or colts foot. These are mere suggestions tending to induce thought & examination

The may be axillary. Terminal Solitary. Umbellous. Corymbous &c. &c.

Spica. racemes. Cymbaeis

We have Ladies, now finished the consideration of the description of the exterior of the different species of trunk. – 5 in number. Caulis – Culmus, Scapus, Fronds & Stipes.

Surculus & Stolo. Wildenow. We have been almost afraid of introducing those terms that are necessary towards perfect knowledge of them but we thank you for your patience & we shall now commence a drier, but a still more pleasant subject.

Next in order an inclination we shall discuss the subject of the leaf and after dwelling slightly upon the nomenclature of leaves and showing some of the most common forms we shall quit that day to resume subject and speak of their uses, both public and private, of the sensibility or perceptibility upon the application of external stimuli

X with peculiar properties in this flow

We we shall endeavour to illustrate the subject of the anatomy of the stem. Commencing with a few remarks. Most plants have something which may be called stems, the ferns plants, have one compounded stem, the leaf, Some plants however have no stems but are all

want of locomotive powers
want of a stomach.
want of sensibility.
want of mouths. Roots are mouths.

stem excepting during flowering such as the Genus Cactus or Cereus. Some Bots. say the C. has no leaf others that it is all leaf, having no stem.

Grew of England was among the first of Philosophers who accurately examined and discussed the anatomy of vegetables. He most Evidently plant, as endowed with life; which life is not perhaps dependent upon simple organization; However, it is very certain that they partake of something very analogous to the life of animals & I am fully persuaded that they are the lowest and inferior grade of animals perhaps capable of sensibility or what Percival ~~as~~ ~~[illegible]~~ elegantly calls perceptivity. That living of which we can say that they have the power enjoy this power, they must have a various & peculiar organization

* we believe
No animated being is without a cuticle.
It serves as an investing membrane to them
all. You may have all seen it in the human
species. You all know that the water ~~in~~-
~~tain~~ accumulated in a blister is kept there
by a thin ~~translucent~~ membrane, which it
necessary is cut on order to let it out.
This thin membrane is the cuticle. Scales
in fish. in Serpent

which is adapted to their grade of sensibility or perceptivity.

The trunk or stock of a tree consists of seven parts. ~~Five of these only can be absent, perhaps in any plant.~~ They are the Epidermis or cuticle, ~~[illegible] to the cortical [illegible]~~. The Cortex - Liber Alburnum. 5 Lignum. The Silver grain and 6. The Medulla - all except the Cuticle and Medulla have been proven vascular or reflete with vessels.

The Cuticle is a thin transparent covering of all plants. Some Animals are without it. It corresponds with the cuticle of animals as in man (show it) * Apparently it is not organized but seems, as I think by examination, with the microscope to be made of utricles disposed upon each other. In a dry state it is impenetrable to water

It is produced from the cuticle which covers the little plant in the seed.

It is worthy of notice that animals have a certain temperature peculiar to their constitution. The constant temperature of the human body is about 95° of Far.
Fordyce & Sir Joseph Bank and others constructed a room which they heated to the boiling of water 212°. F. and they lived in it 40 or 50 minutes. They placed the thermom: which in the air stood at 212 in the mouth & it sunk more than one half to 95 the constant heat of man. Apples would bake in their hands. They breathed upon their hands to cool them & their own skin felt very cold. Thus was the human body enabled to resist

In herbaceous plants we find only one Lamina and ~~is~~ in the in shrubs as in the currant. But in other plants you may discover successive layers and they appear as dead part of bore strata, which in cold climates may in a measure prevent the effects of frost, being slow conductors of heat, of course heat can't pass out between them and the tree is capable of retaining its own natural heat when the temperature of the air is below nought & Zero -

We say that the Epidermis is impenetrable by moisture, by this we mean not to deny the great use of the cuticle, which is to protect the alternate ramifications of the aerial & aqueous vessels; those minute vessels, by which they are enabled to absorb & exhale aeriform fluidities

which are needful to the life healthy and beauty of the plant. altho the cuticle may have these pores, yet the are natural ones and they ~~pass~~ pass thro' the cuticle without making a part of it, while the other part is impervious

In some trees we find many lamina of cuticle Dr Barton discovered many in the (Betula papyrifera ?) but we doubt of this be altogether correct since we believe that a new cuticle is formed annual & that the former one dies altho' it remains adhering to the bark.

Serpent cutting its skin.

Some plants as the Equisetum the cuticle has a silaceous deposite in the cuticle which will give an high polish to Andirons and shovel & tongs