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About the Institute
The Hunt Institute for Botanical Documentation, a research division of Carnegie Mellon University, specializes in the history of botany and all aspects of plant science and serves the international scientific community through research and documentation. To this end, the Institute acquires and maintains authoritative collections of books, plant images, manuscripts, portraits and data files, and provides publications and other modes of information service. The Institute meets the reference needs of botanists, biologists, historians, conservationists, librarians, bibliographers and the public at large, especially those concerned with any aspect of the North American flora.

Hunt Institute was dedicated in 1961 as the Rachel McMasters Miller Hunt Botanical Library, an international center for bibliographical research and service in the interests of botany and horticulture, as well as a center for the study of all aspects of the history of the plant sciences. By 1971 the Library's activities had so diversified that the name was changed to Hunt Institute for Botanical Documentation. Growth in collections and research projects led to the establishment of four programmatic departments: Archives, Art, Bibliography and the Library.

(26)

Sharrock, R (167), The History of the Propagation & Improvement of Vegetables by the concurrence of Art & Nature. 2nd edn. (? Royal Soc.)

[mention 1st ed if u is to quote] former (Boyle

[1th. 19.7] The Epistle :: Dedicated :: Impt like IV

Robert Boyle

~~To Rob~~ Dedn. [Epistle D

Sir,

It is a saying in ... which is any Mans ow... by any new Act or D... is, then the Dedica... meerly Usurpatory, ... yours.

Have thus made more his

... of which,

x x x

I gave my self ... eye, all Books I ... not intending to treat an... much of the particular ... reason to have Rega...

x x x

Just taken

But as others Authors, in those relati... any thing of truth, I have done them this right, where even I could relieve an Operation or Experiment in their words, with truth & fitness, I spared to cayn new (denying & suppressing no Author in his credit, ~~not~~ nor to purloyn his reputation) though I had learned the truth of the same thing from the testimony of my eyes

(Sharrock) 2 27

p 3 Simplicity? style in philosophy

"being a little Disgusted with any thing not suited for the use of Philosophy when overgarnished with Rhetorical Tropes, which like Flowers stuck in a Window ... certainly create a darkness in the place."

p 4-5

"Thistles, though they have a perfect seed, yet the Earth will bring them forth without it. The same thing cannot be said of Wheat, or other useful Plants. Ferne & Heath, Mushroom & Moss, & some other of like Natures arise also without seed, & so might Lilies & Roses ~~still~~ still have done, had not the production of better Plants been made more difficult by that Curse of God which man drew upon the Earth.

~~Before the Curse~~ 'This is an unhappiness, that [illegible] the Earth whereas before mans transgression it Spontaneously, & without humane Industry or Culture, brought forth all manner of useful Plants, according to the command of God, Gen. I. 11. Now since the Curse, it bringeth forth of its own accord only those that are less useful, & the rest, not without the Art, & the sweat of man!" ....

p 9-10

You see how that Text of Genesis is true, where it is said, that God created every plant of the field before it was in the Earth, & every herb before it grew. Namely the principles & seeds of them were created in the first Chaos. And to this first Creation of Plants before they grew, must we have recourse for the cause of all those spontaneous productions of Vegetables, such of

(Sharrock)

mean as sprigs of them are occurred without seed, or any other of the usual means of Propagation.

p 19

There is a great controversie concerning Harts-tongue, Maydenhair of divers sorts, Scolopendrium, Fernes, & other Plants, whose property is to have the back of the leaf lined with a brown dusty substance, whether this substance be a seed.... I dare not disbelieve this (when perfectly ripe) to be a true seed, because divers, & very experienced persons (as Mr Bobart particularly) affirm, that they have seen the small Plants, or Seedlings, at a distance all round the Mother-plant growing up as is ordinary for shed seed of other plants, & by Microscopes, the likeness of this dust to other seeds is apparently seen.

p 56

I have often heard persons affirm, that they have sowed Barley, or some other grain, and in the ground the seed hath been so altered, as to send forth Oates instead of Corn, according to its own species. I am as yet far from giving any assent to this their History.

[after giving his reasons] he concludes:—

" My opinion therefore is, That the fallacy which befel my abovenamed Relators was, that they mistook the cause of the production of the Oates mentioned; for since it is much more easie to conceive, that by some evil accident,

Sharrock

as it often happens (the Seed-corn being corrupted & perish'd in the ground) the ground its self from its own seminary, sends out the (sic) supposititious Crop of Oats or Mustard, than that there should be a variety of so shape & Nature, or declension from its property, in the issue of any species.

p 62-3

(Specification)

"In Ireland there is a Lake, wherein (as that Noble Person [the Hon Robert Boyle] I have now mentioned, than whom no greater philosophy faculty hath related to me) there are whetstones used in that nation, thought the best, made of wood, cast therein to be petrified. In which stones, though all the lineaments of the woody fibres remain, yet they are indued with the hardness, & other qualities of an exact stone. ... And of the Density ... & so made the whole question, if the form be specifically, that by the aggregation of a certain number of accidents; that [what up 17 cent. meant of accidents] accidents & their number must be assigned that are enough to complete a new form, before we begin to judge in the matter. For that very many accidents may be changed, it appears by the above-named instances in Vegetables, & in other bodies many more: Vinegar and Wine, are the same parts transposed, yet there seems to be more difference between them, than between Endive and Cichory, Maidenhair & Scolopendrium, Rubarbe & Dockes, which are Vegetables esteemed for divers species, formally or Specifically distinguished.

pp 68-9 (Sharrock) 30 5

[Extraordinary good account of the manner of growth of seeds. Must see the 1st edn. 1660 to see if all this is in it. Anything in it is different here would be could have taken it of Grew, published in the same year, ~~AA~~ of the order to be presented is dated 1671]

"All seeds that I know have within their Coves actually a Neb, which answers or not, which is joyned to leaves more or less in number: betwixt the stalks of (or amidst) these leaves there is a bud, eye or Germen, just opposite to the Neb, or initial Root, though by reason of its smallness it is scarce discernable in many seeds till it begins to spring.

1. Most Plants have only two leaves actually joyned to the Neb, which are commonly very unlike the proper leaves of the Plant; of this sort are the flowers of the Sun, ... Cucumbers, ... Thistles, ... Mallows of divers kinds, Arch-angels, Spurges, Netels, Clary," but Orach, Dill, Parsely hath two leaves dissimilar, but not much so, Melilot two dissimilar, some, if I mistake not, similar.

2. Many Plants have more Leaves in their arising from the Neb, as Cresses have six.

3. Some Plants have but one dissimular leaf, as Anemonies, Tulips, Fritellaries, & all bulbous spring flowers that I have observed. Wheat, Barly, Rye, all grain & grasses that I know have a Germen wrapped up at one end of the grain in a close sheath, which

~~p 60 &~~ Sharrock p 65

Semen consists of leaves wrapped down the bud ...
Now both the chit corn divide itself into leaves, & coats or husk, as in those examples, but the greater part thereof contains a meal, that by the heat & moisture of the soyl is turned into a pappy substance not unlike the chyle found in the lacteals of animal bodies, & may be, as I suppose, reposed nourishment for the young blade or stem as the Earth would prove but a dry Nurse".

p 70 Beans, Pease, Kidney-beans, Lupins, have this peculiarity, that the seed-lobes, each half of which is one of these dissimilar leaves, divide usually contained in every seed; & between these chits leaves are contained often similar leaves, or seed as differ but in growth & bigness from the true leaves of the Plant. 'Tis observed in all these great seeds, that through the pulse, or thick part of the grain perish, yet if the Neb and small leaves are entire, the seed may prosper; so I have seen Field-beans that have been eaten through with worms, prove good thriving seed. x x x After the root is well made & fastned between the leaves, that were actually contained in the seed, then & not before, then arise into more plain sight & appearance, that little Semen before, in many places scarce seen, like a true bud, which springs, buys forth the true leaves & branch of the Plant-sowen.

If I am enquired of, whether each seed has a

complete essence and distinct form of its own.
Nay further, whether it be a true & perfect ~~plant~~
Plant? I must say that I have found it so
to be, even more than an egg, a living thing, & [illegible]
immediately nourishable; It has root & [illegible], body
to bear the part of the Plant, Bark to draw the Sap
into all its parts, & germen or bud to secure the means of
future growth, & to shoot leaves, which is all & somewhat
more than in the winter, the stoutest Oke can
boast of.

It has been accounted an Intrinsic [illegible] in Philosophy
heretofore, & that in our Schools, that seed
should not be esteemed an actual & formal plant,
because of divers absurdities, that if seed were animal,
would happen in their School Doctrine... But this
I am sure of, that Truth can have no bad
consequence, & am content that it is no Heresie
now to appeal to sense from a Doctors opinion, & that
I may freely in this matter require (no') to be tryed by
my garden, though it be against the sentence and
judgement of the Doctors"

Th ~~em~~ embryo & embryology

p 74
Talks about to mysterious character of seed growth, & [illegible]
ago that no theory of seed growth yet propounded
really explains "how the upper part of the Neb
or germen orderly frames the Vegetable above ground
in so trim a body, rather than a confused mass,"
x x x "I may possibly by some be thought
severe in judging that the causes of these appearances
have not yet been resolv'd."... I confess that

[specifick]
for all the causes + wayes of production, explain'd
either by Sir Kenelm, or other our Noble wits,
I see no reason but why even by granting the Sun,
+ all the Elements, to have the operations supposed
by them, Their Oak might bear Pippins as well
as Acorns, why an Acorn might not produce a
Tree wit leaves like a Cabbage as well as those
proper to the Oak. For those general causes they
are wont to alledge, seem not to me, nor to any
reasonable man, sufficient to produce the particular
Specifications of so many thousand Plants,
that in all grounds + Climats, continue in, and
keep their Natures, + to produce there are found without
any notable alteration; the Sun may distend or
dilate the fruits, or flowers, or leaves, by rarifying,
and drawing plenty of juice, but if there be any
other power beside that particular + specifick one
that was given to every Plant at the first Creation,
able to variegate the leaves, the flowers, + seeds, +
barks, + woods of every Plant answerable to the vast
variety there is in them; I confess it is a power that I
never yet was so learned or so happy as to understand.

p130 [annual rings]
It's prov'd by Experience, that there is every
year a new coat of Wood made to every thriving
Tree, by apposition of saps hardned into a
thin Board (as I may call it) insomuch that I
have known divers Woodmen, that would boldly

assert the determinate number of years, that any Oke, or other Wood, has thrived in, by the number of those several distinct Rings of Wood that are to be counted from the middle or Center of the Tree, to the outside of it, is being credited, & that I think with reason, that every one of these Rings arose from the apposed & hardned sap of every several year.

p 131

// I am perswaded that as there is in every Seed an actual Plant, so there is in every Bud an actual Bough, and that a Cyon for Bud differ but as a greater & lesser branch. But how the sap of the Stock (suppose a White Thorn) can serve to make the Wood, Bark, Leaves, and fruit of its Cyon, suppose a Pear, is a difficult question: For grant there be an elective attraction of sap from the earth; yet how shall a white Thorn choose that which is fit for a Pear? × × × × But if there be supposed in the world, and all several Bodies, but one Element or material Principle, from which, by Natures undescryed Wisdom, in appointing it unto several motions & changes of situation, & giving different Measures & Figurations to its smallest Particles, there arise all the varieties in the world; then there will be no difficulty, how the

(Sharrock)

Same sort of matter should give substance both to the Stock and graff, though Plants of different nature, and bearing different Boughs, Leaves, Fruits, Seeds, each from other; for if from any matter, anything may be made without difference, then particularly the wildest Stock may afford Elements fit to nourish the boughs of any Plant, of how gentle & noble nature soever.

p139

Sharrock tried Sir Kenelm Digby's experiment with nettle ashes, & when he froze the lye he found figures like harps, daisy comets, "Piazzo's" ~~comets~~ Cows ~~poundas~~ of large ~~Pyrgos~~ Trees Copse, or Chapiterlers Windows, a grove) a Battel ~~______~~ pillars, feathers, a figure of a mountain, limn'd, "Sometimes also like the sort of ~~little~~ "little thickets of Furre-trees" of the seeing all these things he concludes" or 'I am in became mad to an Admiration, that in so much Variety as we have seen, we could not phansy one formed Nettle"

p141

He discusses the experiment ~~dipp~~ reported at second hand by Sir Kenelm Digby – including a dozen glasses ~~hermatically~~ hermetically sealed each contains the ashes of one plant, & on heating, there arose out of ashes the flower & the stalke of that plant of which these

ashes were made. "But however,
(this is but a way to raise the Idea of a
Plant, not the Plant it self: And if any
such way there be, It is yet hid in
Rosycrucian darkness. And therefore we have
not raised above the vulgar Physiology,
or willy to think that what in these
cases appear'd, was neither Plant, nor the
Idea of a Plant, but only the Phansy of
such Idea.

p 157
There is a thing [illegible] defended & frequently,
both in discourse Printed & spoken, that the
chips of Elm, being sowed, will grow; ....
(magnified in old kind in subsequent copy
"Tis certain they will grow sometimes"
(error) sometimes can by standing by
turn to pelly; sometimes

x x The cause of the Country-mans mistake (for I
suppose not that this error arose from Philosophers)
imagine to be this: At the felling of Elm-
many chips must need be scattered, & lie round
about the tree, & be covered in the grass, thereabouts;
now the next year, after the fall, there arise
generally great numbers of Suckers from the
roots of the old Tree, which roots must needs
all the sap they gather up into these Suckers,
the great Trunck being removed. And these
Suckers are easily mistaken to arise from the chips,
because they always come upon the felling of

Elves where chips are found, & grow at such distance as chips are ordinarily scattered.

p 244

Pomum tree buds are geometrically arranged on the stem.

p247–8

in divers ~~pl~~ of those Plants whose Stalks are set with Joynts, & those Joynts with beautiful Circle of leaves, proper to each Plant, ... the feismess, notwithstanding, are found to follow the order [observed in ~~Water-betony~~, Fig-wort, Mints etc] as my be seen in Madder, Goos-grass, Ladies-Bedstraw

p 248

"I cannot think of a Plant, according to the ordinary estimation of men, that is more contemptible then that which grows ordinarily in Bogs, or miry Ditches, & is called Great-Horse-tail; yet if any man please to disartuate ?disarticulate the whole, & take particular view both of the parts & conjuncture, they will find the frame exquisite enough to deserve better esteem; for both stalks & leaves are made up of divers pieces, framed, as it were, in joyner-work; all which pieces bear exact proportion each to other; & each receives other ~~bindented~~ ?bidented terminations, which form very beautifull Coronets on the peices so received; then at a convenient

Shamrock

distance, above each of these Coronets, there ariseth a very beautiful Circle of Leaves [stems], & these very leaves are made up of hollow peices articulately, & proportionably joynted, in imitation of the elegancy of the joynts of the stalk it self.

[Coronets = ~~leaf-lea~~ leaf whorls
leaves = ~~stems~~ latent branches]
p249

new§ And generally the Leaves then stand not according to the Quincunx, either stand in joynts, in the fashion of the Burgundian Cross as on the Cross-wort; or in a Circle, as in most sorts of madder, Ladies-bed-straws, Wood-roofe; or in some other proportionable, fit & beautiful posture: And though in those creeping and entangled Plants, irregularities are not unfrequently seen, yet even in their irregularities themselves, there often seems to be a greater curiousness, & more proper order; as particularly, Madder is generally tetragonal, & notwithstanding its circular border of Leaves, usually sends forth Buds, according to the manner of Mints, & other Plants of a four-square Stalk: This I have sometimes seen in many of its Branches to vary & turn hexagonal, or to have a stalk with six ribs, upon which declension the order of the Germens was thus most fitly altered; upon each rib or angle there was always one leaf, & upon every other rib, a

germen under the leaf; then I found no place, that no one rib did bear the Bud in the two succeeding joynts; so that if in the first joynt, the three Buds stood on the first, the third, & the fifth ribs, then in the second joynt, the Bud stood on the second, the fourth, & the sixth, & so interchangeably to the very top." p 250

Sees directions for methods of observing phyllotaxis + alts

"Care must be had, that observation be made on such Plants whose stalks are not twisted, for the twisting puts the Leaves & Germens out of order"

(Bare woodcarvers in [Hh. 19. 7]

Drope, F (1672) A Short and sure Guid in the Practice Of Raising and Ordering y Fruit-Trees. Oxford, Printed for Ric. Davis, 1672

p 114-115

"This manner of growth is manifested in (by action of Woodmen, who, & know of what age any underwood is, do cut off a stick (viz. of Hazel or Sallow) somewhat aslope, + by telling the scaly orbes (which some men call colts) suppose they know the age of the wood; their Coast) do know the age of the wood; their orbes cannot be so distinguished, were not every year a new one made of the hardened sap. Mere orbes in young sticks may be separated, but in old wood they seem appear."