

The Anatomy of Plants: with an Idea of a Philosophical History of Plants: and several other Lectures, read before the Royal Society by Nehemiah Grew M. D. Fellow of the Royal Society, and of the College of Physicians. Printed by William Rawlins for the Author, 1682.

THis *Work* was begun, about Nineteen years past; since then, hath been carried on by the special Appointment of the *Royal Society*; and by their order, is now made publick.

The *Idea*, prefixed to the *Anatomy*, gives us an account of the *Materials* and *Methods* necessary for making a compleat *History* of *Plants*; which are copiously proposed under these five General Heads of Enquiry: *viz.* First, Of those Things, which are of more External consideration about *Plants*, as their *Figures* &c. Secondly, Of their Compounding Parts, as *Vessels* &c. Thirdly, Of their *Liquors* and other Contents. Fourthly, Of their Principles, as *Salts* &c. Fifthly, Of their Aliment, as *Water* and other means of Growth. Aiming, chiefly, at the discovery of the reason of *Vegetation*, and of the Virtues of *Plants*.

The *Anatomy* is divided into four *Books*. In the First, all the *Observations*, except one or two, are made with the

the naked Eye. To the End, a Proof might first be given, How far it is possible for us to go without the help of *Glasses*; which many Ingenious men want; and more, the *patience* to manage them. It begins with the *Seed* sow'n, and so proceeds to the *Root, Trunck, Branch, Leaf, Flower, Fruit*, and lastly to the *Seed* also to be sow'n again; for each, allowing one whole *Chapter*. In every *Chapter*, the *Anatomy* of the *Part* being first given; the *Uses* are subjoyned. And there being two *Chapters* for the *seed*; in the first is shewed the manner of its *Growth*; and in the last, the manner of its *Generation*.

The *Second Book*, is divided into Two *Parts*. The First, containeth the *Anatomy* of *Roots*: which is here prosecuted both with the *naked Eye*, and with the *Microscope*. It begins with some special Remarks of the *Motions* and some other properties of *Roots*. Next, proceeds to the *Anatomy* of the *Skin, Bark, Wood, and Pith*: giving the Description of several sorts of *Sap-Vessels*; as also of the *Air-Vessels* or *Lungs*; and of the *Bladders* and *Fibres* of the *Pith* and all the *Parenchymous* parts of a *Plant*; and shewing the elegant and accurate Work of Nature in all. Particularly, that the *Pith* is a *Rete mirabile*; herein more curious, than that in the *Braine*; in that its *Fibres*, are not only exquisitely small, very regularly composed together.

The *Second Part*, gives a large account of the *Vegetation* of *Roots*: shewing, how the ground is prepared for it; How the *Sap* Imbib'd, and distributed to the several *Parts*; How the several *Parts* are nourished; How they are Formed; and how they come to be situate or dispos'd. How *Roots* obtain their different size and shape; How their different *Motion*; and different *Age*: How the Contents of the several *Parts* are made; and how their *Odors, Colors, and Tasts*. And what is here said, is also applicable to the same *Parts* in the *Trunk* &c.

The *Third Book*, is also divided into Two *Parts*. The First,

First, containeth the *Anatomy* of *Trunks* and *Branches*, which is here prosecuted in like manner, as the former of *Roots*. Further shewing, the admirable Artifice of *Nature*, in the Structure and Composition of all the *Parts* of a *Plant*. As amongst others, in *Tab.* 36, 37, 38, 39. and 40. In *Tab.* 29. f. 1, 2, 3; the *Vessels* are represented above six hundred thousand times bigger, than they appear to the naked Eye; the structure whereof, cannot be discerned, without being magnified to that degree.

The *Second Part* (omitting what is said of the Vegetation of *Roots*, and is thence applicable unto *Trunks*) consisteth on the further clearing of these following particulars; *viz.* The motion and course of the *Sap*; The motion and course of the *Air*; The Structure of the *Parts*: The Generation of *Liquors*; The Figuration of *Trunks*; The motion of *Trunks*; and their *Nature*, as fitted for *Mechanical Use*.

The *Fourth Book*, is divided into four *Parts*. The First, of *Leaves*. In which, are described, first, their Protections and Folds; Then, those things which appear upon their Surface; The apparent Position of their *Fibres*, and the Measures of their Circumference, defined by the *Arches* of several *Circles*, having the same or divers centres and *diametres*, and the length of the *Leaf*, or certain equal parts thereof subtracted or multiply'd, being the *Standard* for the *diametres* of those *Circles*. Next the *Apertures*, *Parts*, and curious *Texture* of *Leaves*: and the Time, and manner in which they are formed. Where the *Author* designs an ascent to the highest step in the business of *Generation*.

The *Second Part*, of *Flowers*. In which, are described the three General Parts of the *Flower*; *viz.* the *Empa'ement*; the *Foliature*; and the *Attire*, both the Semini form, and the Florid, in which there is a great deal of curious and unexpected Variety; which *Nature* hath bestow'd upon these *Parts*, next to the *Seed* it self, of great-
est

est use. For every *Plant* being ἀρρενωδὸς the *Attire*, answers to the *Genitals* of *Male* and *Female* both together; and the *Powder* which they disburse let fall upon the *Uterus*, is the *Sperme* of *Plants*. The *Time* also, in which the *Flower* is form'd, is observed, not to be the same *Year* in which it appears, as hath hitherto been thought, but the year before.

Hereto is subjoyned an *Appendix*; being a *Method* propos'd for the ready finding, by the *Leaf* and *Flower*, to what sort any *Plant* belongeth.

The *Third Part*, of *Fruits*. In which are described these following, viz. an *Apple*, *Limon*, *Cucumber*, *Pear*, *Plum*, *Grape*, *Gooseberry*, and some others; which are so many several sorts of the *Fleshy Uterus*. Next, of the *Seed-case* or *Membranous Uterus*. And lastly, the *Use* of the several *Parts*, both to the *Fruit* and *Seed*, is set down. Particularly, the manner of the *Ejaculation* of the *Seed* in *Noli-me-tangere*.

The *Last Part*, of *Seeds*. Wherein we have first, a *Description* of the *Various* and *Elegant Figures* of *Seeds*. Next, an account of their *Number*, and several *Motions*, and for what purpose they are made. As for instance, in the *Seed* of *Harts Tongue* and all that *Tribe*, which are shot off with a spring contriv'd for it. The annual product of these *Seeds* from one *Plant*, being about a *Million*; of which, ten Thousand, are not so big as a white *Pepper Corn*. After this, the *Description* and *Use* of the *Covers* of the *Seed*, and of the *Vitellum*; Of the several *Parts* of the *Fœtus* or true *Seed*; and lastly, a further account of the rare contrivance of the *Stone* in *Fruits*, and of the three *Membranes* over the *Seed*, in order to the *Generation* and growth of the same. Thus far the *Anatomy*.

The following *Lectures* are these.

I. Of the *Nature*, *Causes*, and *Power* of *Mixture*. In discourse whereof, a *Foundation* is laid for these *Axioms*, Sc. That the whole business of the *Material World*, is nothing

nothing else but *Mixture*. That Natural and Artificial *Mixture* are the same, as also the *Causes* of both. And that therefore, so far as we can govern *Mixture*, we may do what *Nature* doth. As in rendering all *Bodies* sociable or mingleable; In making Artificial *Bodies* in imitation of those of *Natures* own production; and other particulars, of which Instances are given. In a short *Appendix* to this Discourse, notice is taken of Mr. *Pappins* New *Digester*; and how directly it is deducible from one of those *Rules* laid down in the fifth *Chapter* (Section the fifth) for the *Mixture* and *Dissolution* of *Bodies*.

II. *Experiments* in *Consort*, of the *Luctation* arising from the *Mixture* of several *Menstruum's* with all sorts of *Bodies*. Being a *Specimen* of a *Natural History* of the *Materia Medica*.

III. An *Essay*, of the various *Proportions*, wherein the *Lixivial Salt* is found in *Plants*.

IV. A Discourse concerning the *Essential* and *Marine* or *Muriatick Salts* of *Plants*. In which is shewed the way of making the same.

V. A Discourse of the *Colours* of *Plants*.

VI. A Discourse of the *Diversities* and *Causes* of *Tastes*, chiefly in *Plants*. With an *Appendix* containing some observables of the *Odors* of *Plants*.

VII. *Experiments* in *Consort* upon the *Solution* of of *Salts* in *Water*. From whence, (amongst other *Inferences* of import in relation to *Natural Philosophy*) the *Cause* of the *Motion* of the *Mercury* in the *Barometre*, is assign'd.

The *Plates* to this *Work*, are fourscore and three, all upon *Sheets* and half *Sheets*.

*Excerpta ex literis Ill. & Clariss. Virorum
ad Nob. Ampliss. & consultiss. D.
Joh. Hevelium Conf. Gedanensem
perscriptis, Judicia de Rebus Astro-
nomicis, ejusdemque Scriptis, exhiben-
tia, studio ac operâ Johannis Erici Ol-
hoffij Secretarij Gedani Anno 1683 4^o.*

THE Compiler of this Book being now Secretary of the Republick of Dantzic, has happily chosen a Subject which gives him Opportunity to publish the extraordinary merit of his friend, the famous and learned *Hevelius*; and at the same time to advance the Reputation of his Country, where such men have been bred up, and called to be *Magistrates*. The Work it self consists but of a part of Fifteen Volumes of Letters, written by some of the chiefest men of this Age, to *Hevelius* in Commendation of his *Selenography*, *Cometography* and *Machina Cælestis*, already published, and for his further encouragement to go on with his other *Astronomical* designs, yet unfinished. The *Encomiums* given in these Letters are greater then can be comprehended by those that have not read them, and are to be valued by the worth and honour of those persons they come from, among whom the Great *Monsieur Colbert* deserves well to be mentioned, the Sincerity of whose Praises need not be doubted of, since they came accompanied with good *Solid Bills of Exchange*.

Tractatus

Traſtatus de Podagra & Hydrope per Tho Sydenham
M. D. Londini 1633.

THe account this Treatiſe gives us of the *Gout* is grounded upon the Author's many Years experience, both of the diſeaſe it ſelf, and of the method of cure. He is very exact in his deſcription of the riſe, progreſs, cauſes and Symptoms of it, and tells us thoſe men are moſt commonly attacked by it in their age, whoſe Youth was pampered with ſpirituous VVines, and high Diet, whom though they perceived no inconveniences but what their exerciſes then carried off, yet the neceſſary unactivenes of old age made them ſuffer what an active and vigorous Youth permitted them not to feel. Not that the young or the lean are totally exempt from it, inheritance and exceſs of *Venerſy* often bringing it upon thoſe whoſe years and conſtitution might elſe have been privileged, and among all mankind he obſerves thoſe moſt liable and made for it, whoſe large heads, and moiſt, lax, and full habit of body marks them out, and diſpoſes for its reception. But if any man is ſo happy as to eſcape it till he is old, he is never ſo often or ſo much afflicted, as he who is ſeized in his youth, either death preventing the full growth of the diſeaſe, or the native heat being not ſtrong enough to through off the *materia morbiſica* upon the Joints. The regular time of its invaſion he aſſigns the latter end of *January*, or the beginning of *February*, the chief time of its fury is at night, with which the pain proportionably declines, a ſeries of which ſhort Fits conſtitute the general one, which ſometimes laſt two or three Months, and thoſe who are in years, or weakened by other Diſtempers it ſeldom leaves till the full Summer drives it away.

Among the other ſad attendants of this diſtemper he brings in the *Stone*, which happens to moſt either from their long lying on their backs, or from the intermiſſion of the uſual *ſecretions*, or elſe becauſe both diſtempers may probably ſpring from one and the ſame matter.

Neither is the body alone thus afflicted, but the torments reach the mind, ſo that every *Paroxyſm* is as much a fit of Anger, as of the *Gout*. upon contemplation of all the *Symptomes* he imputes the whole diſtemper to the *deſect* of *concoction*, in the parts and humours of the body, which the want of animal ſpirits many other ways formerly waſted, neceſſarily infers, by the great decay of the *ferments*, whoſe force depends chiefly upon them.

As for the cure he deſigns antecedently the digeſtion of the humours, and in the Fit the allaying of the heat, and *Ebullition* of them
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arising from their putrefaction; to the great opposition of which intentions he attributes the great difficulty commonly met with in endeavouring to remove this Distemper.

The *Dropsie* he makes universal extending to all ages and Sexes, though women are more liable to it than men, and are most commonly exposed to it either when they are barren, or when age hath rendered them incapable of Child-bearing. The true Symptoms of it are difficulty of breathing, little Urine and much thirst, the consumption of the other parts likewise in proportion to the encrease of the *Hydropical* constantly happens. The general cause he supposes the *weakness* of the *blood*, which not being able to assimilate the *Chyle*, lets it fall into the pendulous parts of the Body, till at last it enters the Abdomen, where while the quantity of it is small, *nature* forms little bladders to contain it, till at last exceeding all measure, it knows no bounds but those of the *Peritonæum*. The causes which weaken the blood he takes to be the excess of *Venesectiõ*, or of any other Evacuation, any long distemper, or a constant abuse of Spirituous drinks. His indications are to evacuate the water, and to strengthen the blood, for both which he gives particular directions, and among his remedies these two especially he commends, viz, *Elaterium*, and *Crocus metallorum*.

Discourfing of the hidden conveyances nature carries of these waters by, he infers the great use of *Anatomy* in *Physick*, as being that, without which it is impossible to form clear *Ideas* either of the nature or causes of the diseases; And does not in the least doubt the success of his method, unless the *viscera* by long lying in the waters are corrupted. He does not much commend the *Paracentesis* or the *Acupuncture*, they being as likely to cause a *Gangrene* as *Blisters* themselves, by the way he takes notice of the burning with *Moxa*, which he will not allow to have a *Specifick* quality in its flame, any more than another actual fire, and although we owe this Medicine to the *Indians*, yet it was not unknown to the *Antients*, for *Hippocrates* directs cauterising with raw Flax in the very case of the *Gout*.

OXFORD,

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