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NATURAL MAGICK

BY

John Baptista Porta,
A NEOPOLITANE.

IN

TWENTY BOOKS

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| 1 Of the Causes of Wonderful Things. | 11 Of Perfuming. |
| 2 Of the Generation of Animals. | 12 Of Artificial Fires. |
| 3 Of the Production of New Plants. | 13 Of Tempering Steel. |
| 4 Of Increasing Household-Stuff. | 14 Of Cookery. |
| 5 Of changing Metals. | 15 Of Fishing, Fowling, Hunting, &c. |
| 6 Of counterfeiting Gold. | 16 Of Invisible Writing. |
| 7 Of the Wonders of the Load-stone. | 17 Of Strange Glasses. |
| 8 Of strange Cures. | 18 Of Statick Experiments. |
| 9 Of Beautifying Women. | 19 Of Pneumatick Experiments. |
| 10 Of Distillation. | 20 Of the Chaos. |

Wherein are set forth
All the RICHES and DELIGHTS
Of the

NATURAL SCIENCES.



L O N D O N,

Printed for *John Wright* next to the Sign of the Globe in
Little-Britain. 1669.



The Preface to the READER.

COURTEOUS READER,

IF this Work made by me in my Youth, when I was hardly fifteen years old, was so generally received and with so great applause, that it was forthwith translated into many Languages, as Italian, French, Spanish, Arabick; and passed through the hands of incomparable men: I hope that now coming forth from me that am fifty years old, it shall be more dearly entertained. For when I saw the first fruits of my Labours received with so great Alacrity of mind, I was moved by these good Omens; And therefore have adventured to send it once more forth, but with an Equipage more Rich and Noble.

From the first time it appeared, it is now thirty five years, And (without any derogation from my Modesty be it spoken) if ever any man laboured earnestly to disclose the secrets of Nature, it was I: For with all my Minde and Power, I have turned over the Monuments of our Ancestors, and if they writ anything that was secret and concealed, that I enrolled in my Catalogue of Rarities. Moreover, as I travelled through France, Italy, and Spain, I consulted with all Libraries, Learned men, and Artificers, that if they knew any thing that was curious; I might understand such Truths as they had proved by there long experience. Those places and men, I had not the happiness to see, I writ Letters too, frequently, earnestly desiring them to furnish me with those Secrets, which they esteemed Rare; not failing with my Entreaties, Gifts, Commutations, Art, and Industry. So that whatsoever was Notable, and to be desired through the whole World, for Curiosities and Excellent Things, I have abundantly found out, and therewith Beautified and Augmented these, my Endeavours, in NATURAL MAGICK, wherefore by most earnest Study, and constant Experience, I did both night and day endeavour to know whether what I heard or read, was true or false, that I might leave nothing unassayed: for I oft thought of that Sentence of Cicero, It is fit that they who desire for the good of mankind, to commit to memory things most profitable, well weighed and approved, should make tryal of all things. To do this I have spared no Pain nor Cost, but have expended my narrow Fortunes in a large magnificence.

Nor were the Labours, Diligence, and Wealth, of most famous Nobles, Potentates, Great and Learned Men, wanting to assist me; Especially (whom I name for his Honour) the Illustrious and most Reverend Cardinal of Eftings: All which did afford there Voluntary and Bountifull Help to this Work. I never wanted also at

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my House an Academy of curious Men, who for the trying of these Experiments, cheerfully disbursed their Moneys, and employed their utmost Endeavours, in assisting me to Compile and Enlarge this Volume, which with so great Charge, Labour, and Study, I had long before provided.

Having made an end thereof, I was somewhat unwilling to suffer it to appear to the publick View of all Men (I being now old, and trusting up my Fardel) for there are many most excellent Things fit for the Worthiest Nobles, which should ignorant men (that were never bred up in the sacred Principles of Philosophy) come to know, they would grow contemptible, and be undervalued; As Plato saith, to Dionysius, They seem to make Philosophy ridiculous, who endeavour to prostitute Her Excellence to prophane and illiterate Men.

Also here are conceived many hurtful and mischievous things, wherewith wicked and untoward men may mischief others; What then must I do? let Envy be driven away, and a desire to benefit Posterity, vanquish all other thoughts: The most Majestick Wonders of Nature are not to be concealed, that in them we may admire the Mighty Power of God, his wisdom, his Bounty, and therein Reverence and Adore him. Whatsoever these are, I set them before you, that you may discern my Diligence and Benevolence towards you; Had I withheld these Things from the World, I fear I should have undergone the reproach of a wicked man; for (Cicero derives this from Plato) we are not born for our selves alone, but our Countrey will challenge a part, our Parents and our Friends require their parts also from us. Wherefore such Things as hitherto lay hid in the Bosome of wondrous Nature, shall come to light, from the Store-houses of the most ingenious Men, without fraud, or deceit.

I Discover those Things that have been long hid, either by the Envy or Ignorance of others, Nor shall you here finde empty Trifles, or Riddles, or bare Authorities of other men.

I did not think fit to omit any thing by erring Honestly, or following the best Leaders, But such as are Magnificent and most Excellent, I have veil'd by the Artifice of Words, by Transposition and Depression of them; And such Things as are hurtful and mischievous, I have written obscurely; yet not so, but that an ingenious Reader may unfold it, and the wit of one that will thoroughly search may comprehend it.

I have adde some things that are Profitable, and rarely Known, because they are most true. Sometimes from Things most Known, and meanly esteemed, we ascend to Things most Profitable and High, which the Minde can scarce reach unto: One's Understanding cannot comprehend High and Sublime Things, unless it stand firm on most true Principles. The Mathematical Sciences, rise from some trivial and common Axioms, to most Sublime Demonstrations. Wherefore I thought it better to Write true Things and Profitable, than false Things that are great. True Things be they never so small, will give occasions to Discover greater things by them. The infinite multitude of Things is incomprehensible, and more than a man may be able to contemplate.

In our Method I shall observe what our Ancestors have said; Then I shall shew by my own Experience, whether they be true or false, and last of all my own Inventions, That Learned Men may see how exceedingly this later Age hath surpassed Antiquity.

Many men have written what they never saw, nor did they know the Simples that were the Ingredients, but they set them down from other mens traditions, by an inbred and importunate desire to adde something, so Errors are propagated by succession, and at last grow infinite, that not so much as the Prints of the former remain.

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That not onely the Experiment will be difficult, but a man can hardly reade them without laughter.

Moreover, I pass by many men, who have written Wonders to be delivered to Posterity, promising Golden Mountains, yet Write otherwise then they thought. Hence most ingenious men, and desirous to learn, are detained for a very long time (and when they despair of obtaining what they seek for, they finde that they spent their time, pains, and charge in vain) and so driven to desperation, they are forced to repent by leisure: Others grown wise by other mens harms, learn to hate these Things before they know them.

I have divided these Secrets into several Classes, that every man may finde what he likes best.

Lastly, I should willingly pass by the offending of your Ears, if I had no care to reveal the Calumnies of detractors and envious men, that most immorally wound me, calling me a Sorcerer, a Conjuror, which names from my tender Youth I have abhorred. Indeed I always held myself to be a man subject to Errors and Infirmities; therefore desired the assistances of many Learned men, and that if I had not faithfully interpreted, they would reprove me; But what I always feared came to pass, fully interpreted, they would reprove me; But what I always feared came to pass, that I should fall into the hands of some vile and hateful men, who by doing injury to others, justly or unjustly, labour to win the popular and ease Approbation, and Applause of the Vulgar, by whose venom'd Teeth, those that are wounded do not compass, but by retorting the venome back upon them, they overthrow their own Honor.

A certain Frenchman in his Book called Daemonomania, Teares me a Magician, a Conjuror, and thinks this Book of mine, long since Printed, worthy to be burnt, because I have written the Fairies Oynment, which I set forth onely in detestation of the frauds of Devils and Witches; That which comes by Nature is abused by their superstition, which I borrowed from the Books of the most commendable Divines. What have I offended herein, that they should call me a Conjuror? But when I enquired of many Noble and Learned Frenchmen, that were pleased to Honour me with their Visits, what that man was, they answered that he was an Heretick, and that he had escaped from being cast headlong from a Tower, upon Saint Bartholomew his day, which is the time appointed for the destruction of such wicked men. In the mean time I shall desire the great and good God (as it becomes a Noble and Christian man to do) that he may be converted to the Catholike Faith, and may not be condemned whilst he lives.

Another Frenchman who unworthily reviled all the Learned men of his Age, joins me amongst them, and holds, that onely three Physicians, that are his Friends, are Praise-worthy, as the most Learned of all men of our Times; and amongst them he reckons up himself; for the Book is published in his Name, it is a wonder what Inventions that man hath found out to win praise, who having no man to commend him, nor is he worthy commendations, yet he hath undertaken to commend himself. I pass over other men of the same temper, who affirm that I am a Witch and a Conjuror, whereas I never Writ here nor elsewhere, what is not contain'd within the bounds of Nature.

Wherefore, Studios Readers, accept my long Labours; that cost me much Study, Travel, Expence, and much Inconvenience, with the same Minde that I publish them; and remove all Blindness and Malice, which are wont to dazzle the sight of the Minde, and hinder the Truth; weigh these Things with a right Judgement, when you try what I have Written, for finding both Truth and Profit, you will (it may be) think better of my Pains. Yet I am assured there will be many ignorant people, void of all serious Matters; that will Hate and Envy these Things, and

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will Rashly pronounce, That some of these Experiments are not only false, but impossible to be done; And whilst they strive by Arguments and vain Disputes, to overthrow the Truth, they betray their own ignorance: Such men, as vile, are to be driven from the Limits of our NATURAL MAGICK: For they that believe not Natures Miracles, do, after a manner, endeavour to abolish Philosophy. If I have over-passed some Things, or not Spoken so Properly of them, as I might; I know there is nothing so Beautiful, but it may be Adorned; Nor so Full, but it may be Augmented.

J. B. P.

The

The FIRST BOOK OF Natural Magick:

Wherein are searched out the Causes of things which produce wonderful Effects.

CHAP. I.

What is meant by the name of *Magick*.



Orphyrus and Apuleius, great Platonicks, in an Oration made in the defence of Magick, do witness, that Magick took her name and original from Persia. Tully, in his book of Divination, saith, that in the Persian language, a Magician is nothing else but one that expounds and studies divine things; and it is the general name of Wise-men in that country. S. Jerome writing to Paulinus, saith that Apollonius Tyanicus was a Magician, as the people thought; or a Philosopher, as the Pythagoreans esteemed him. Pliny saith, that it is received for a certainty among most Authors, that Magick was begun in Persia by Zoroastres the son of Orimasius; or, as more curious Writers hold, by another Zoroastres, surnamed Proconnesius, who lived a little before. The first Author that ever wrote of Magick, was Oshanes, who going with Xerxes king of Persia in the war which he made against Greece, did scatter by the way as it were the seeds and first beginnings of this wonderful Art, infecting the world with it wheresoever he came; inasmuch that the Grecians did not onely greedily desire this knowledge, but they were even mad after it. So then Magick is taken amongst all men for Wisdom, and the perfect knowledge of natural things: and those are called Magicians, whom the Latines call Wise-men, the Greeks call Philosophers, of Pythagoras onely, the first of that name, as Diogenes writes: the Indians call them Brackmans, in their own tongue; but in Greek they call them Gymnosophists, as much to say as naked Philosophers: the Babylonians and Assyrians call them Chaldeans, of Chaldaa a country in Asia: the Celtes in France call them Druids, Bards, and Semnothires: the Egyptians call them Priests; and the Cabalists call them Prophets. And so in divers countries Magick hath divers names. But we finde that the greatest part of those who were best seen into the nature of things, were excellent Magicians: as, amongst the Persians, Zoroastres the son of Orimasius, whom we spake of before; amongst the Romanes, Numa Pompilius; Thespion, amongst the Gymnosophists; Zamolxis, amongst the Thracians; Abbaris, amongst the Hyperboreans; Hermes, amongst the Egyptians; and Budda, amongst the Babylonians. Beside these, Apuleius reckons up Carionides, Damigeron, Hysmoses, Apollonius, and Dardanus, who all followed Zoroastres and Oshanes.

CHAP. II.

What is the Nature of *Magick*.

There are two sorts of Magick: the one is infamous, and unhappie, because it hath to do with foul spirits, and consists of Inchantments and wicked Curiosity; and this is called Sorcery; an art which all learned and good men detest; neither is it able to yeeld any truth of Reason or Nature, but stands meerly upon fancies and imaginations, such as vanish presently away, and leave nothing behind them; as Jacobus writes in his book concerning the myteries of the Egyptians. The other

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perfection. First, let a man consider and prepare things providently and skilfully, and then let him fall to work, and do nothing unadvisedly. This I thought good to speak of, that if at any time the ignorant be deceived herein, he may not lay the fault upon us, but upon his own unskilfulness: for this is the infirmity of the scholar, and not of the teacher: for if rude and ignorant men shall deal in these matters, this Science will be much discredited, and those strange effects will be accounted hap-hazard, which are most certain, and follow their necessary causes. If you would have your works appear more wonderful, you must not let the cause be known: for that is a wonder to us, which we see to be done, and yet know not the cause of it: for he that knows the causes of a thing done, doth not so admire the doing of it; and nothing is counted unusual and rare, but onely so far forth as the causes thereof are not known. *Aristotle* in his books of Handy-trades, saith, that master-builders frame and make their tools to work with; but the principles thereof, which move admiration, those they conceal. A certain man put out a candle; and putting it to a stone or a wall, lighted it again; and this seemed to be a great wonder: but when once they perceived that he touched it with brimstone, then, saith *Galen*, it ceased to seem a wonder. A miracle, saith *Ephesus*, is dissolved by that wherein it seemed to be a miracle. Lastly, the professor of this Science must also be rich: for if we lack money, we shall hardly work in these cases: for it is not Philosophy that can make us rich; we must first be rich, that we may play the Philosophers. He must spare for no charges, but be prodigal in seeking things out; and while he is busy and careful in seeking, he must be patient also, and think it not much to recal many things; neither must he spare for any pains: for the secrets of Nature are not revealed to lazy and idle persons. Wherefore *Epicharmus* said very well, that men purchase all things at Gods hands by the price of their labour. And if the effect of thy work be not answerable to my description, thou must know that thy self hast failed in some one point or another; for I have set down these things briefly, as being made for witty and skilful workmen, and not for rude and young beginners.

CHAP. IV.

The opinions of the ancient Philosophers touching the causes of strange operations; and first, of the Elements.

THose effects of Nature which oft-times we behold, have so employed the ancient Philosophers minds in the searching forth of their causes, that they have taken great pains, and yet were much deceived therein; inasmuch that divers of them have held divers opinions: which it shall not be amiss to relate, before we proceed any farther. The first sort held that all things proceed from the Elements, and that these are the first beginnings of things; the fire, according to *Hippasus Metapontinus*, and *Heraclides Ponticus*; the air, according to *Diogenes Apolloniates*, and *Anaximenes*; and the water, according to *Thales Milesius*. These therefore they held to be the very original and first seeds of Nature; even the Elements, simple and pure bodies (whereas the Elements that now are, be but counterfeits and bastards to them; for they are all changed, every one of them being more or less medled with one another) those, say they, are the material principles of a natural body, and they are moved and altered by continual succession of change; and they are so wrapt up together within the huge cope of heaven, that they fill up this whole space of the world which is situate beneath the Moon; for the fire being the lightest and purest Element, hath gotten up aloft, and chose it self the highest room, which they call the element of fire. The next Element to this is the Air, which is somewhat more weighty than the fire, and it is spread abroad in a large and huge compais; and passing through all places, doth make mens bodies frangible to her temperature, and is gathered together sometimes thick into dark clouds, sometimes thinner into mists, and so is resolved. The next to these is the water; and then the last and lowest of all, which is scraped and compacted together out of the purer Elements, and

and is called the Earth; a thick and grosse substance, very solid, and by no means to be pierced through: so that there is no solid and firm body but hath earth in it, as also there is no vacant space but hath air in it. This Element of earth is situate in the middle and centre of all, and is round beset with all the rest; and this only stands still and unmoveable, whereas all the rest are carried with a circular motion round about it. But *Hippon* and *Critias* held that the vapours of the Elements were the first beginnings: *Parmenides* held that their qualities were the principles; for all things (saith he) consist of cold and heat. The Physicians hold that all things consist of four qualities, heat, cold, moisture, drouth, and of their predominancy when they meet together; for every Element doth embrace as it were with certain armes his neighbour-Element which is next situate to him; and yet they have also contrary and sundry qualities whereby they differ: for the wisdom of nature hath framed this workmanship of the world by due and set measure, and by a wonderful fitnessse and conveniency of one thing with another; for whereas every Element had two qualities, wherein it agreed with some, and disagreed with other Elements, nature hath bestowed such a double quality upon every one, as finds in other two her like, which she cleaves unto: as for example, the air and the fire; this is hot and dry, that is hot and moist: now dry and moist are contraries, and thereby fire and air disagree; but because either of them is hot, thereby they are reconciled. So the Earth is cold and dry, and the water cold and moist; so that they disagree, in that the one is moist, the other dry; but yet are reconciled, in as much as they are both cold; otherwise they could hardly agree. Thus the fire by little and little is changed into air, because either of them is hot; the air into the water, because either of them is moist; the water into the earth, because either of them is cold; and the earth into fire, because either of them is dry: and so they succeed each other after a most provident order. From thence also they are turned back again into themselves, the order being inverted, and so they are made mutually of one another: for the change is easie in those that agree in any one common quality; as fire and air be easily changed into each other, by reason of heat: but where either of the qualities are opposite in both, as in fire and water, there this change is not so easie. So then, heat, cold, moisture and drouth, are the first and principal qualities, in as much as they proceed immediately from the Elements, and produce certain secondary effects. Now two of them, namely heat and cold, are active qualities, fitter to be doings themselves, then to suffer of others: the other two, namely moisture and drouth, are passive; not because they are altogether idle, but because they follow and are preferred by the other. There are certain secondary qualities, which attend as it were upon the first; and these are said to work in a second sort; as to soften, to ripen, to resolve, to make lesse or thinner: as when heat works into any mixt body, it brings out that which is unspure, and so whilst it strives to make it fit for his purpose, that it may be more simple, the body becometh thereby smaller and thinner: to cold doth preserve, binde, and congeal; drouth doth thicken or harden, and makes uneven; for when there is great store of moisture in the utter parts, that which the drouth is not able to consume, it hardens, and so the utter parts become rugged; for that part where the moisture is gone, sinking down, and the other where it is hardened, rising up, there must needs be great roughnesse and ruggednesse: so moisture doth augment, corrupt, and for the most part works one thing by it self, and another by some accident; as by ripening, binding, expelling, and by such like, it brings forth milk, urine, monthly flowers, and sweat; which the Physicians call the third qualities, that do so wait upon the second, as the second upon the first: and sometime they have their operations in some certain parts, as to strengthen the head, to succour the reins; and these, some call fourth qualities. So there are the foundations, as they call them, of all mixt bodies, and of all wonderful operations: and whatsoever experiments they proved, the causes hereof rested (as they supposed) and were to be found in the Elements and their qualities. But *Empedocles Agrigentinus* not thinking that the Elements were sufficient for this purpose, added unto them moreover concord and discord, as the causes of genera-
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tion and corruption: There be four principal seeds or beginnings of all things; *Jupiter*, that is to say, fire; *Pluto*, that is to say, earth; *Juno*, that is to say, air; and *Neptis*, that is to say, water: all these sometimes love and concord knits together in one, and sometimes discord doth sunder them and make them lie apart. This concord and discord, said he, are found in the Elements by reason of their lundry qualities wherein they agree and disagree: yea, even in heaven it self, as *Jupiter* and *Venus* love all Planets save *Mars* and *Saturn*, *Venus* agrees with *Mars*; whereas no Planet else agrees with him. There is also another disagreement amongst them, which ariseth from the oppositions and elevations of their houses: for even the twelve signs are both at concord and at discord among themselves, as *Manilius* the Poet hath shewed.

CHAP. V.

That divers operations of Nature proceed from the essential forms of things.

ALL the Peripateticks, and most of the latter Philosophers could not see how all operations should proceed from those causes which the Antients have let down; for they find that many things work quite contrary to their qualities, and therefore they have imagined that there is some other matter in it, and that it is the power and properties of essential formes. But now that all things may be made more plain, we must consider that it will be a great help unto us, for the making and finding out of strange things, to know what that is from whence the virtues of any thing do proceed: that so we may be able to discern and distinguish one thing from another, without confounding all order of truth. Whereas one and the same compound yields many effects of different kinds, as we shall find in the processe of this Book, yet every man confesseth that there is but one only original cause therein that produceth all these effects. And seeing we are about to open plainly this original cause, we must begin a little higher. Every natural substance (I mean a compound body) is composed of matter and form, as of her principles: neither yet do I exclude the principal qualities of the Elements from doing their part herein; for they also concur, and make up the number of three principles: for when the Elements meet together in the framing of any compound, the same compound retains certain excellent and chief qualities of theirs; whereof though all help together to bring forth any effects, yet the superiour and predominant qualities are held to do all, because they make the power of their inferiours to become theirs: for unlesse some were stronger then other, their virtues could not be perceived. Neither yet is the matter quite destitute of all force: I speak here, not of the first and simple matter, but of that which consists of the substances and properties of the Elements, especially the two passible elements, the Earth and the Water: and those which *Aristotle* calleth sometimes secondary qualities, sometimes bodily effects, we may term them the functions and powers of the matter; as thinnesse, thicknesse, roughnesse, smoothnesse, easinesse to be clef, and such like, are altogether in the power of the matter, howbeit they proceed all from the Elements. Therefore to avoid confusion, it is better to hold that the effects of the qualities come of the temperature or mixture of the Elements, but the effects of the matter from the consistence or substances of them. But the Form hath such singular vertue, that whatsoever effects we see, all of them first proceed from thence; and it hath a divine beginning: and being the chiefest and most excellent part, absolute of her self, she useth the rest as her instruments, for the more speedy and convenient dispatch of her actions: and he which is not addicted nor accustomed to such contemplations, suppoeth that the temperature and the matter works all things, whereas indeed they are but as it were instruments whereby the form worketh: for a workman that useth a graving Iron in the carving of an Image, doth not use it as though that could work, but for his own furtherance in the quicker and better performance thereof. Therefore whereas there are three efficient and working causes in every compound, we must not suppose any

any of them to be idle, but all at work, some more and some lesse; but above all other, the form is most active and busie, strengthening the rest; which surely would be to no purpose, if the form should fail them, in as much as they are not capable of heavenly influences. And though the form of it self be not able to produce such effects, but the rest also must do their parts, yet are they neither confounded together, nor yet become divers things; but they are so knit among themselves, that one stands in need of anothers help. He that scans these things well by the search of reason, shall find no obscurity herein, nor confound the knowledge of the truth. Wherefore that force which is called the property of a thing, proceeds not from the temperature, but from the very form it self.

CHAP. VI.

Whence the Form cometh; and of the chain that Homer faigned, and the rings that Plato mentioneth.

SO then, the form, as it is the most excellent part, so it cometh from a most excellent place; even immediately from the highest heavens, they receiving it from the intelligences, and these from God himself: and the same original which the Form hath, consequently the properties also have. *Zeno Citicis* holds two beginnings, God and Matter; the one of them active or efficient, the other the passive principle. For God, as *Plato* thinks, when by the Almighty power of his Deity he had framed in due measure and order the heavens, the stars, and the very first principles of things the Elements, which wast away by reason of so many generations and corruptions, did afterwards by the power of the Heavens and Elements, ordain the kinds of living creatures, plants, and things without life, every one in their degree, that they might not be of the same estate and condition as the heavens are; and he enjoyed inferiour things to be ruled of their superiours, by a set Law, and poured down by heavenly influence upon every thing his own proper Form, full of much strength and activity: and that there might be a continual encrease amongst them, he commanded all things to bring forth seed, and to propagate and derive their Form wheresoever should be fit matter to receive it. So then, seeing that formes come from heaven, they must needs be counted Divine and heavenly things: for such is the pattern and the most excellent cause of them, which *Plato*, that chief Philosopher, calls the soul of the World, and *Aristotle* universal Nature, and *Avicenna* calls it the Form-giver. This Form-giver doth not make it of any thing, as though it were but some frail and transitory substance, but fetcheth it merely out of himself, and bestows it first upon intelligences and stars, and then by certain aspects informeth the Elements, as being fit instruments to dispose the matter. Seeing therefore this Form cometh from the Elements, from heaven, from the intelligences, yea from God himself; who is so foolish and untoward, as to say that it doth not favour of that heavenly nature, and in some sort of the Majesty of God himself; and that it doth not produce such effects, as nothing can be found more wonderful, seeing it hath such affinity with God? Thus hath the providence of God linked things together in their ranks and order, that all inferiour things might by their due courses be derived originally from God himself, and from him receive their Operations. For God the first cause and beginner of things, as *Macrobius* saith, of his own fruitfulness hath created and brought forth a Spirit, the Spirit brought forth a Soul, (but the truth of Christianity saith otherwise) the Soul is furnished partly with reason, which it bestows up Divine things, as heaven and the stars (for therefore are they said to have Divine Spirits) and partly with sensitive and vegetative powers, which it bestows upon frail and transitory things. Thus much *Virgil* well perceiving, calleth this Spirit, The soul of the World; The Spirit, saith he, cherisheth it within, and conveying it self through the inmost parts, quickens and moves the whole lump, and closeth with this huge body. Wherefore seeing Man stands as it were in the middle, betwixt eternal and those transitory things, and is not

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altogether so excellent as heaven, and yet, because of his reason, more excellent than other living creatures; and he hath also the sensitive power: therefore the other living creatures, as it were degenerating from man, are indued onely with the two powers that remain, the sensitive and vegetative powers. But the Trees or Plants, because they have neither sense nor reason, but do onely grow, are said to live onely in this respect, that they have this vegetative soul. This the same Poet doth expresse a little after. Seeing then the Spirit cometh from God, and from the Spirit cometh the soul, and the soul doth animate and quicken all other things in their order, that Plants and brut beasts do agree in vegetation or growing, brut beasts with Man in sense, and Man with the Divine creatures in understanding, so that the superior power cometh down even from the very first cause to these inferiours, deriving her force into them, like as it were a cord platted together, and stretched along from heaven to earth, in such sort as if either end of this cord be touched, it will wag the whole; therefore we may rightly call this knitting together of things, a chain, or link and rings, for it agrees fitly with the rings of *Plato*, and with *Hermes* golden chain, which he being the first author of all divine inventions, hath signified to the wife under the shadow of a fable, wherein he feigneth, that all the gods and goddesses have made a golden chain, which they hanged above in heaven, and it reacheth down to the very earth. But the truth of Christianity holdeth that the Souls do not proceed from the Spirit, but even immediately from God himself. These things a Magician being well acquainted withal, doth march heaven and earth together, as the Husband-man plants Elmes by his Vines; or to speak more plainly, he marries and couples together these inferiour things by their wonderful gifts and powers, which they have received from their superiours; and by this means he, being as it were the servant of Nature, doth bewray her hidden secrets, and bring them to light, so far as he hath found them true by his own daily experience, that to all men may love, and praise, and honour the Almighty power of God, who hath thus wonderfully framed and disposed all things.

CHAP. VII.

Of Sympathy and Antipathy; and that by them we may know and find out the vertues of things.

By reason of the hidden and secret properties of things, there is in all kinds of creatures a certain compassion, as I may call it, which the Greeks call Sympathy and Antipathy; but we term it more familiarly, their consent, and their disagreement. For some things are joynted together as it were in a mutual league, and some other things are at variance and discord among themselves; or they have something in them which is a terror and destruction to each other, whereof there can be rendered no probable reason: neither will any wife man seek after any other cause hereof but only this, That it is the pleasure of Nature to see it should be so, that she would have nothing to be without his like, and that amongst all the secrets of Nature, there is nothing but hath some hidden and special property; and moreover, that by this their Consent and Disagreement, we might gather many helps for the uses and necessities of men; for when once we find one thing at variance with another, presently we may conjecture, and in trial so it will prove, that one of them may be used as a fit remedy against the harms of the other: and surely many things which former ages have by this means found out, they have commended to their posterity, as by their writings may appear. There is deadly hatred, and open enmity betwixt Coleworts and the Vine; for whereas the Vine windes it self with her tendrils about every thing else, she shuns Coleworts only: if once she come neer them, she turns her self another way, as if she were told that her enemy were at hand: and when Coleworts is seething, if you put never so little wine unto it, it will neither boil nor keep the colour. By the example of which experiment, *Androcles* found out a remedy against wine, namely, that Coleworts are good against drunken-

drunkenesse, as *Theophrastus* saith, in as much as the Vine cannot away with the favour of Coleworts. And this herbe is at enmity with Cyclamine or Sow-bread; for when they are put together, if either of them be green, it will dry up the other: now this Sow-bread being put into wine, doth encrease drunkenesse, whereas Coleworts is a remedy against drunkenesse, as we said before. Ivy, as it is the bane of all Trees, so it is most hurtful, and the greatest enemy to the Vine; and therefore Ivy also is good against drunkenesse. There is likewise a wonderful enmity betwixt Cane and Fern, so that one of them destroyes the other. Hence it is that a Fern root powned, doth loose and shake out the darts from a wounded body, that were shot or cast out of Canes: and if you would not have Cane grow in a place, do but plow up the ground with a little Fern upon the Plough-shear, and Cane will never grow there. Strangle-tare or Choke-weed desires to grow amongst Pulle, and especially among Beans and Fenches, but it chokes them all: and thence *Dioscorides* gathers, That if it be put amongst Pulle, let to seethe, it will make them seethe quickly. Hemlock and Rue are at enmity; they strive each against other: Rue must not be handled or gathered with a bare hand, for then it will cause Ulcers to arise; but if you do chance to touch it with your bare hand, and so cause it to swell or itch, anoint it with the juice of Hemlock. Much Rue being eaten, becometh poison; but the juice of Hemlock expels it; so that one poison poisoneth another: and likewise Rue is good against Hemlock being drunken, as *Dioscorides* saith. A wilde Bull being tyed to a Fig-tree, waxeth tame and gentle, as *Zoroaster* saith, who compiled a book called *Geoponica*, out of the choice writings of the Antients. Hence it was found out, that the stalks of a wilde Fig-tree, if they be put to Beef as it is boiling, make it boil very quickly, as *Pliny* writeth; and *Dioscorides* minisheth young figs that are full of milky juice, together with a portion of water and vinegar, as a remedy against a draught of Bulls blood. The Elephant is afraid of a Ram, or an engine of war so called: for as soon as ever he seeth it, he waxeth meek, and his fury ceaseth: hence the Romans by these engines put to flight the Elephants of *Pyrrhus* King of the Epyrotes, and so got a great victory. Such a contrariety is there betwixt the Elephants members, and that kind of Lepry which makes the skin of a man like the skin of an Elephant; and they are a present remedy against that disease. The Ape of all other things cannot abide a Snail: now the Ape is a drunken beast, for they are wont to take an Ape by making him drunk; and a Snail well washed is a remedy against drunkenesse. A man is at deadly hatred with a Serpent: for if he do but see a Serpent, presently he is sore dismayed; and if a woman with child meet a Serpent, her fruit becometh abortive: hence it is, that when a woman is in very sore travel, if she do but smell the fume of an Adders hackle, it will presently either drive out, or destroy her child: but it is better to anoint the mouth of the womb in such a case, with the fat of an Adder. The sight of a Wolfe is so hurtful to a man, that if he spie a man first, he takes his voice from him; and though he would fain cry out, yet he cannot speak: but if he perceive that the man hath first espied him, he makes no ado, but his savage fury ceaseth, and his strength failes him. Hence came that proverb, *Lupus in fabula*, the Wolf cometh in the nick; which *Plato* speaks of in his *Politics*. The Wolf is afraid of the Urchin; thence, if we wash our mouth and throats with Urchins blood, it will make our voice shrill, though before it were hoarse and dull like a Wolves voice. A Dog and a Wolfe are at great enmity; and therefore a Wolves skin put upon any one that is bitten of a mad Dog, asswageth the swelling of the humour. An Hawk is a deadly enemy to Pigeons, but they are defended by the Kestrel, which the Hawk cannot abide either to hear or see: and thus the Pigeons know well enough; for wheresoever the Kestrel remains, there also will the Pigeons remain, thinking themselves safe because of their protector. Hence *Columella* saith, That there is a kind of Hawks which the common-people call a Kestrel, that builds her nest about houies, that is very good to keep away hawks from a Pigeon-houie: If you take the Kestrels young ones and put them in divers earthen pots, and cover the pots close, & plaister them round about, and hang them up in sundry corners of a Pigeon-houie, the Pigeons will be so far

in love with the place, that they will never forsake it. Hither belongeth that notable Disagreement that is betwixt Garlick and the Lead-stones: for being smeared about with Garlick, it will not draw iron to it; as *Plutarch* hath noted, and after him *Protopius*: the Lead-stone hath in it a poisonous vertue, and Garlick is good against poison: but if no man had written of the power of Garlick against the Lead-stone, yet we might conjecture it to be so, because it is good against vipers, and mad dogs, and poisonous waters. So likewise those living creatures that are enemies to poisonous things, and swallow them up without danger, may shew us that such poisons will cure the bitings and blows of those creatures. The Hart and the Serpent are at continual enmity: the Serpent as soon as he seeth the Hart, gets him into his hole, but the Hart draws him out again with the breath of his nostrils and devours him: hence it is that the fat and the blood of Harts, and the stones that grow in their eyes, are mingled as fit remedies against the stinging and biting of serpents. Likewise the breath of Elephants draws Serpents out of their dens, and they fight with Dragons; and therefore the members of Elephants burned, drives away Serpents. The Storks drive out of the Countreys where they are, Lizards, and sundry kinds of Serpents, and other noisome things in the fields: and the intrails of them all are good against the Storks. The same is done also in Egypt by the bird Ibis. That Indian Rat, called *Ichnemumon*, doth harness himself with some of the Lore-tree, and so fights against the Asp. The Lamprey fights with Serpents, and with her biting, kills the Basilisk, which is the most poisonous serpent that is. So also the crowing of a Cock affrights the Basilisk, and he fights with Serpents to defend his hens; and the broth of a Cock is a good remedy against the poison of serpents. So the Snail and the Eagle. The Strellion, which is a beast like a Lizard, is an enemy to the Scorpions; and therefore the oyle of him being purified is good to anoint the place which is stricken by the Scorpion. The Barbel eats up the Sea-hare, and is good against the poison thereof. A Swine eats up a Salamander, without danger, and is good against the poison thereof. The Hawk is an enemy to the Chameleon, and his dung drunken in wine, is good against the poison of the Chameleon. Likewise out of the Sympathies of plants, we may gather some secret, which is helpful against some kind of hurt. The herb Corruada, whereof Sperage comes, is most fitly planted where Reed grows, because they are of much likeness and nearness; and both of them are inciters to lust. The Vine and the Olive-tree do joy in each others company, as *Africana* writes: both of them are very commodious for mens uses. In like manner the Morehenne loves the Hart, which is given to lust; both of their members are inciters to venery. The Goat and the Partridge love each other; and both these are good for one and the same remedy. So the fish Sargus and the Goat. A Dog is most friendly to a man; and if you lay him to any diseased part of your body, he takes away the disease to himself; as *Pliny* reporteth.

CHAP. VIII.

That things receive their force and power from Heaven, and from the Stars; and that thereby many things are wrought.

I Suppose that no man doubts but that these inferiour things serve their superiours, and that the generation and corruption of mutable things, every one in his due course and order, is over-ruled by the power of those heavenly Natures. The Egyptians, who first proved and found out the effects of the heavens, because they dwell in the open Champion-fields, where they had continually fair weather, and there were no vapours sent up from the earth which might hinder their contemplation of heaven, so that they might continually behold the Stars in their brightnesse, did therefore wholly bestow themselves in the knowledge of heavenly influences: and whereas others that were not so diligent as they, stood amazed at the causes of things, these men referred all to the heavens and the Stars, that all things took their destiny from them, and that the influence of heaven bare great sway in all generations and corruptions; and thus observing the motions of the stars to and fro, they wrought many wonderful things; for

Of the Causes of Wonderful things.

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for this was their resolution, that to certain hours and set times, there were answerable certain aspects of superiour powers, whereby all things were effected. *Protopius* was of the same minde, who reduced the heavenly influences to a certain order, and thereby did prognosticate many things: and he thought the matter to be clear, that it need not much proof: and moreover, that the increase and decrease of all plants, and all living creatures, more or lesse, did proceed from the power and stroke of the stars. *Aristotle*, finding that the highest motion was the cause and beginning of all things, (for if that should cease, these must needs presently decay) saith, that it was necessary for this world to be placed very neer and close to the superiour motions, that all power might be thence derived; and he saw that all this force of inferiour things was caused from the Sun, as he himself fitly shews: The winding course of the Sun, saith he, in the oblique circle of the Zodiak, causeth the generation and corruption of all transitory things; and by his going to and fro, distinguisheth times and seasons. *Plato* saith, that the circular motions of the heavens are the causes of fruitfulness and barrenness. The Sun is the Governour of time, and he rule of life. Hence *Jamblichus* following the doctrine of the Egyptians, saith, that every good thing cometh certainly from the power of the Sun; and if we receive any good from any thing else, yet the Sun must perfect and finish it. *Heraclitus* calls the Sun, the Fountain of heavenly light; *Orpheus* calls it the light of life; *Plato* calls it a heavenly Fire, an everliving Creature, a star that hath a Soul, the greatest and the daily star: and the natural Philosophers call it the very heart of heaven. And *Plotinus* shews, that in ancient times the Sun was honoured in stead of God. Neither yet is the Moon lesse powerful, but what with her own force, and what with the force of the sun which she borrows, she works much, by reason of her nearness to these inferiours. *Abu-ajar* said, That all things had their vertue from the Sun and the Moon: and *Hermes* the learned said, that the Sun and the Moon are the life of all things living. The Moon is night to the Earth of all Planets; she rules moist bodies, and she hath such affinity with these inferiours, that as well things that have souls, as they that have none, do feel in themselves her waxing, and her waining. The Seas and Floods, Rivers and Springs, do rise and fall, do run sometimes swifter, sometimes slower, as she rules them. The furies of the Sea are toft to and fro, by continual succession; no other cause whereof the Antients could find but the Moon only: neither is there any other apparent reason of the ebbing and flowing thereof. Living creatures are much at her beck, and receive from her great increase: for when she is at the full, as *Lucilius* saith, she feeds Oysters, Crabs, Shellfish, and such like, which her warm light doth temper kindly in the night season; but when she is but the half or the quarter light, then she withdraws her nourishment, and they waste. In like manner, Cucumbers, Gourds, Pompons, and such like, as have store of waterish juice, feel the state of the Moon: for they wax as she doth; and when she waineth, they waste, as *Athenius* writes. Likewise the very stems of plants do follow the state of the heavens; witness the Husband-man, who finds it by experience in his grafting, and skilful Husbandmen have found the course and season of the year, and the monthly race of the Moon so necessary for plants, that they have supplied this knowledge to be one chief part of Husbandry. So also, when the Moon passeth through those signs of the Zodiak which are most peculiar to the earth, if you then plant trees, they will be strongly rooted in the earth: if you plant them when she passeth through the signs of the Air, then the tree so planted, will be plentiful in branches and leaves, and encrease more upward than downward. But of all other, the most pregnant sign hereof is found in the Pome-granate; which will bring forth fruit just to many years, as many dates as the Moon is old when you plant it. And it is a report also, that Garlick, if it be set when the Moon is beneath the earth, and be also plucked up at such a time, it will lose its strong savour. All cut and lopped Woods, as Timber and Fewel, are full of much moisture at the new of the Moon; and by reason of that moisture, they wax soft, and so the worm eats them, and they wither away. And therefore *Democritus* counsaileth, and *Varronius* is also of the same minde, to cut or lop trees in the

the waining of the Moon, that being cut in season, they may last long without rottenesse. And that which is more, as her age varies, so her effects vary according to her age; for in her first quarter, she maketh hot and moist, but especially moist; from thence all moist things grow and receive their humidity in that time; from that time to the full of the Moon, she gives heat and moisture equally, as may be seen in Trees and Minerals: from that time to the half Moon decaying, she is hot and moist, but especially hot, because she is fuller of light; thence the fishes at that time commonly are wont to swim in the top of the water, and that the Moon is in this age warm, appears by this, that it doth extend and enlarge moist bodies; and thereby the moisture encreasing, it causeth rottenesse, and maketh them wither and waste away. But in her last quarter, when she loseth all her light, then she is meely hot; and the wises of *Chaldea* hold that this state of heaven is best of all other. So they report that there is a Moon-herb, having round twirled leaves of a blewish colour, which is well acquainted with the age of the Moon; for when the Moon waxeth, this herb every day of her age brings forth a leaf; and when she waineth, the same herb loseth for every day a leaf. These variable effects of the Moon, we may see more at large, and more usually in tame creatures and in plants, where we have daily sight and experience thereof. The Pismire, that little creature, hath a sense of the change of the Planets: for she worketh by night about the full of the Moon, but she resteth all the space betwixt the old and the new Moon. The inwards of mice answer the Moons proportion; for they encrease with her, and with her they also shrink away. If we cut our hair, or pair our nails before the new Moon, they will grow again but slowly; if at or about the new Moon, they will grow again quickly. The eyes of Cats are also acquainted with the alterations of the Moon, so that they are sometimes broader as the light is lesse, and narrower when the light of the Moon is greater. The Beetle marketh the ages and seasons of the Planets: for he gathering dung out of the mixen, rounds it up together, and covereth it with earth for eight and twenty daies, hiding it so long as the Moon goeth about the Zodiac; and when the new Moon cometh, he openeth that round ball of dirt, and thence yields a young Beetle. Onions alone, of all other herbs, (which is most wonderful) feels the changeable state of the Planets, but quite contrary to their change frameth it self; for when the Moon waineth, the Onions encrease; and when she waxeth, they decay: for which cause the Priests of *Egypt* would not eat Onions, as *Plutarch* writes in his fourth Commentary upon *Hesiod*. That kinde of spurge which is called *Helioscopium*, because it follows the Sun, disposeth of her leaves as the Sun rules them; for when the Sun riseth, she openeth them, as being desirous that the morning should see them rise; and shutteth them when the Sun setteth, as desiring to have her flower covered and concealed from the night. So many other herbs follow the Sun, as the herb Turn-sole: for when the Sun riseth, she holds down her head all day long, that the Sun may never so much as writhe any of her (there is such love as it were betwixt them) and she stoops still the same way which the Sun goeth: so do the flowers of Succory and of Mallows. Likewise the pulle called Lupines, still looks after the Sun, that it may not writhe his stalk; and this watcheth the Suns motion so dully, that like a Dial it shews the Husband-man the time of the day, though it be never so cloudy; and they know thereby the just time when the Sun setteth: and *Theophrastus* saith, that the flower of the herb Lorum, is not only open and shut, but also sometimes hides, and sometimes shews her stalk from Sun-set to midnight; and this, saith he, is done about the River *Euphrates*. So the Olive-tree, the Sallow, the Linden-tree, the Elm, the white Popple-tree, they declare the times of the Suns standing, when it turns back again from the Poles; for then they hide their leaves, and shew only their hoar-white backs. In like manner winter-Cresses or Irium, and Penyril, though they begin to wither being gathered, yet if you hang them upon a stick about the time of the Solstice, they will for that time flourish. The stone Selenices, (as much as to say, the Moon-beam) called by others Aphrotesilion, contains in it the Image of the Moon, and shews the waxing and waining of it every day in the same Image. Another stone there

there is, that hath in it a little cloud that turns about like the sun, sometimes hiding, & sometimes shewing it self. The Beast Cynocephalus rejoiceth at the rising of the Moon, for she he stands up, lifting his fore-feet toward heaven, and wears a Royal Busk upon his head: and he hath such a Sympathy with the Moon, that when she meets with the Sun (as betwixt the old and new Moon) so that she gives no light, the male, or He-Cynocephalus, never looks up, nor eats anything, as bewailing the lesse of the Moon; and the female, as male-content as He, all that while pisseth blood; for which causes, these beasts are nourished and kept in hallowed places, that by them the time of the Moones meeting with the Sun may be certainly known, as *Cross* writes in his Hieroglyphicks. The star Arcturus, at his rising causeth rain. Dogs are well acquainted with the rising of the Canicular star; for at that time they are commonly mad; and so are vipers and serpents; nay, then the very standing pools are moved, and wines work as they lye in the Cellar, and other great and strange effects are wrought upon earth: when this star riseth, Basil-gentle waxeth whiterish, and Coriander waxeth dry, as *Theophrastus* writeth. The rising of this star was wont to be diligently observed every year; for thereby they would prognosticate, whether the year following would be wholesome or contagious, as *Heracles Ponticus* saith: for if it did rise dark and gloomy, it was a sign that the Air would be thick and foggy, which would cause a pestilence: but if it were clear and lightsome, it was a sign that the Air would be thin and well purged, and consequently healthfull. In ancient times they much feared this Star, so that they ordained a dog to be offered in sacrifice to it, as *Columella* saith, that this star is pacified with the blood and entrails of a sucking whelp; and *Ovid* likewise saith, that a dog bred on the earth, is sacrificed to the Dog-star in Heaven. The Beast or wilde Goar, which in *Egypt* is called *Oryx*, hath a sense or feeling of this Star before it riseth; for then he looks upon the Sun-beams, and in them doth honour the Canicular star. *Hippocrates* saith, it is not good either to purge or let blood, before or after this star riseth; and *Galen* shews that many very necessary operations of this Star must be observed in Critical dayes; and likewise in sowing and planting. Moreover, the greater stars and constellations must be known, and at what time they go out of the signs, whereby are caused many waterish and fiery impressions in the Air. And whosoever is rightly seen in all these things, he will ascribe all these inferiours to the stars as their causes; whereas if a man be ignorant hereof, he loseth the greatest part of the knowledge of secret operations and works of nature. But of this argument, we have spoken in our writings of the knowledge of Plants.

CHAP. IX.

How to attract and draw forth the virtues of superiour Bodies.

WE have shewed before, the operations of celestial bodies into these inferiours, as also the Antipathy and Sympathy of things: now will we shew, by the affinity of Nature, whereby all things are linked together as it were in one common bond, how to draw forth and to fetch out the virtues and forces of superior bodies. The Platonicks termed Magick to be the attraction or fetching out of one thing from another, by a certain affinity of Nature. For the parts of this huge world, like the limbs and members of one living creature, do all depend upon one Author, and are knit together by the bond of one Nature: therefore as in us, the brain, the lights, the heart, the liver, and other parts of us do receive and draw mutual benefit from each other, so that when one part suffers, the rest also suffer with it; even so the parts and members of this huge creature the World, I mean all the bodies that are in it, do in good neighbour-hood as it were, lend and borrow each others Nature; for by reason that they are linked in one common bond, therefore they have love in common; and by force of this common love, there is amongst them a common attraction, or tilling of one of them to the other. And this indeed is Magick. The concavity or hollownesse of the Sphere of the Moon, draws up fire to it, because of the affinity of their Natures; and the Sphere of the fire likewise

likewise draws up Air; and the centre of the world draws the earth downward, and the natural place of the waters draws the waters to it. Hence it is that the Load-stone draws iron to it, Amber draws chaff or light straws, Brimstone draws fire, the Sun draws after it many flowers and leaves, and the Moon draws after it the waters. *Plotinus* and *Synesius* say, Great is nature everywhere; the layeth certain baits whereby to catch certain things in all places: as she draws down heavy things by the centre of the earth, as by a bait; so she draws light things upward by the concavity of the Moon; by heat, leaves; by moisture, roots; by one bait or another, all things. By which kind of attraction, the Indian Willards hold that the whole world is knit and bound within it self: for (say they) the World is a living creature, everywhere both male and female, and the parts of it do couple together, within and between themselves, by reason of their mutual love; and so they hold and stand together, every member of it being linked to each other by a common bond; which the Spirit of the World, whereof we spake before, hath inclined them unto. For this cause *Orpheus* calleth *Jupiter*, and the Nature of the World, man and wife; because the World is so desirous to marry and couple her parts together. The very order of the Signs declareth, that the World is everywhere male and female; for the former is the male, the latter is the female: so also Trees and Herbs have both sexes, as well as living creatures: so the fire is to the Air, and the water to the Earth, as a male to the female: so that it is no marvel, that the parts of the World desire so much to be matched together. The Planets are partly male, and partly female; and *Mercury* is of both sexes it self. These things the Husband-man perceiving, prepares his field and his seed, for heavenly influences to work upon; the Physician likewise observes the same, and works accordingly, for the preservation both of our bodies, and of universal Nature. So the Philosopher who is skilful in the Stars (for such is properly a Magician) works by certain baits, as it were, fitly matching earthly and heavenly things together, and planting them as skilfully one within another, as a cunning Husband-man planteth an old grasse into a young stock: nay, he layeth earthly things under heavenly things, and inferiours so fitly for their superiours everywhere to work upon, as if a man should lay iron before the Load-stone to be drawn to it, or Chrifall before the Sun to be enlightened by it, or an Egge under a Hen to hatch it. Furthermore, as some can so cherish egges, that even without the help of living creatures, they will make them live; yea and oftentimes they will prepare such matter, so cunningly, that even without egges, or any apparent seeds, they will bring forth living creatures, (as they will bring forth Bees, of an Ox; and a Scorpion, of Basil;) working together by the help of universal Nature upon the vantage of fit matter, and a seasonable or convenient time: even so the Magician, when once he knows which and what kinds of matters Nature hath partly framed, and partly Art hath perfected, and gathered together, such as are fit to receive influence from above; these matters especially doth he prepare and compound together, at such a time as such an influence reigneth; and by this means doth gain to himself the virtues and forces of heavenly bodies: for wheresoever there is any matter so directly laid before superiour bodies, as a looking-glasse before ones face, or as a wall right before ones voice, so doth it presently suffer the work of the Superiours, the most mighty Agent, and the admirable life and power of all things shewing it self therein. *Plotinus* in his Book of Sacrifice and Magick, saith, That the Philosophers considering this affinity and bond of Nature, where with all natural things are linked each to other, did thence frame the Art of Magick, and acknowledged both that the superiours might be seen in these inferiours, and these inferiours in their superiours; earthly things in heavenly, though not properly, but in their causes, and after a heavenly sort; likewise heavenly things in earthly, but yet after an earthly sort. For whence should we suppose it to be, that the plants called Sun-followers, should still follow the Suns motion? and likewise the Moon-followers, the Moons motion? Wherefore surely even in earth we may behold both the Sun and the Moon; but yet by reason of their quality upon earth; and so in heaven we may behold all planets, and stones, and living creatures, but yet as following the heavenly natures: which things the Ancients perceiving,

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did apply and lay some earthly things to some heavenly, and thence brought down the celestial forces into these inferiours, by reason of their likenesse one with the other; for the very likenesse of one thing to another, is a sufficient bond to link them together. If a man do heat a piece of paper, and then lay it a little under the flame of a candle, though they do not touch each other, yet he shall see the paper presently burn, and the flame will still descend till it have burned all the paper. Let us now suppose the paper thus heated, to be that affinity which is betwixt superiours and inferiours; and suppose we also, that this laying of the paper to the candle, to be the fit applying of things together, both for matter, and time, and place: let us suppose yet farther, the flame taking hold of the paper, to be the operation of some heavenly body into a capable matter; and last of all, we may suppose the burning of the paper, to be the altering of that matter into the nature of the celestial body that works upon it, and so purifies it, that in the end it shew upward like burning flax, by reason of some heavenly seeds and sparks which it hath within it self.

CHAP. X.

How the knowledge of secreties dependeth upon the survey and viewing of the whole World.

WE are persuaded that the knowledge of secret things depends upon the contemplation and view of the face of the whole world, namely, of the motion, state and fashion thereof, as also of the springing up, the growing and the decaying of things: for a diligent searcher of Natures workes, as he seeth how Nature doth generate and corrupt all things, so doth he also learn to do. Likewise he learns of living creatures; which though they have no understanding, yet their senses are far quicker then ours; and by their actions they teach us Physick, Husbandry, the art of Building, the disposing of Household affairs, and almost all Arts and Sciences: the like may be observed in Metals, Gems, and Stones. The beasts that have no reason, do by their nature strangely than the eyes of witches, and hurtful things: the Doves, for a preservative against enchantments, first gather some little Bay-tree boughs, and then lay them upon their nests, to preserve their young; so do the Kites use white brambles, the Turtles sword-grasse, the Crows Wither, the Lapwings Venus-hair, the Ravens Ivy, the Hens Carror, the Partridges Reed-leaves, the Black-birds Myrtle, the Larkes grasse, the Swans Park-leaves, the Eagle useth Maiden-hair, or the Stone *Estres* for the same purpose. In like manner they have shewed us preservatives against poysons: the Elephant having by chance eaten a Chamæleon, against the poyson thereof, eats of the wilde Olive; whence *Solinus* observes, That the same is a good remedy for men also in the same case. The Panthers, having swallowed up the poisonous herb *Aconitum*, wherewith the Hunters besmeare pieces of flesh so to destroy them, against the poyson thereof seek out mans dung. The Tortoise, having eaten a serpent, dispels the poyson by eating the herb *Origan*. When Bears have tasted the fruit of the Mandrakes, they eat *Pismires* against the poyson thereof. There is a kind of Spider which destroyeth the Harts, except presently they eat wilde Ivy; and whensoever they light upon any poysonous food, they cure themselves with the Artichoke; and against Serpents they prepare and arm themselves with wilde Parsneps; so do the Ring-doves, Choughs, and Black-birds use Bay-leaves. The little worm *Cimex* is good against the biting of Aspes; as *Pliny* shewes by Hens, who, if they eat that worm, are all day after, free from the hurt of Aspes. Goats care not for Basil-genile, because it brings a Lethargy, as *Chrysippus* writes. The same Beasts have also shewed us what herbs are good to cure wounds. When the Harts are wounded by the Cretians, they seek out the herb *Dittany*, and presently the darts fall out of their bodies. And so do the Goats. The Elephant being wounded, seeks out the juice of Aloes, and thereby is cured. The same Beasts have also found out purgations for themselves, and thereby taught us the same. An Ass eats the herb *Asplenium* to purge his melancholy; of whom

whom the Physicians have learned to Minister the same herb for the same purpose. The Hinde purges her self with large Cummin, before she bringeth forth, that her birth may come the more easily from her. *Aristotle* saith, That Boars feed upon the herb Aram, or Wake-robin, to keep them soluble. Pigeons and Cocks feed upon Pellitory, for the sharpening of their stomach. Dogs eat grasse to purge all their noisome humours, which otherwise would make them mad. Of all these, men have learned to use such Medicines against the like diseases. A Lion being sick of a quartane Ague, eats and devours Apes, and so is healed: hence we know that Apes blood is good against an Ague. The griping of the belly and guts, is healed by looking upon Geese and Ducks, and *Vegetius* writes; and *Columella* saith, that if a Duck do but look upon a sick horse, she heals him: and *Pliny* saith, that if you lay a Duck to the griping of ones belly, she takes away the disease, and dies of it her self; and *Marcellus* writes, That it is good for one that is so troubled, to eat the flesh of a Duck. Goats and Does are never purblind, because they eat certain herbs. Hawks, as soon as they feel their sight dim, they eat Sow-thistle. Elephants, against the diseases of their eyes, drink milk. Serpents have caused Fennel to be very famous; for as soon as they taste of it, they become young again, and with the juice thereof repair their sight; whence it is observed, that the same is good to repair a mans sight that is dim. Hares feed upon herbs that have juice like milk, and therefore in their bellies they have a cream; whence Shepherds have learned to make cream of many such herbs pressed together. Partridges eat leeks, to make their voices clear, as *Aristotle* writes; and according to their example, *Nero*, to keep his voice clear, eat nothing but oyle of leeks, certain dayes in every moneth. These Beasts have likewise found out many instruments in Physick. The Goats, when their eyes are blood-shot, let out the blood; the She-goat by the point of a bull-rush, the He-goat by the pricking of a thorn, which lets out the evil humour, and yet never hurts the eye, but restores him his perfect sight: hence, men learned by such means to cure the eyes. The Egyptians say, they never learned of men to minister clysters, but of the bird Ibis, which useth it to her self for the looseness of her body. And of the same bird also they learned their diet, to eat largely at the waxing, and sparingly at the waning of the Moon. Bears eyes are oft-times dimmed; and for that cause they desire hony-combs above all things, that the Bees stinging their mouths; may thereby draw forth, together with the blood, that dull and grosse humour: whence Physicians learned to use letting blood, to cure the dimness of the eyes. The Gullie-gur, when he is full of meat, he pitcheth himself betwixt two trees, so to force out excrements.

CHAP. XI.

That the likeness of things sheweth their secret vertues.

WHO so looks into the writings of the Ancients, namely, *Hermes, Orpheus, Zoroastres, Harpocraton*, and other such like skilful men as have invented and registered the secreties of this Art, shall find that they gathered all from that likeness of seeds, fruits, flowers, leaves and roots, as also of the stars, metals, gems, and stones; that likeness, I say, which these things have to the diseases and parts of a mans body, as also of other living creatures: and out of those Writers, afterward *Hippocrates, Dioscorides, Pliny*, and the rest, culled out as many such secreties as they found to be true, and recorded them in their own books, except some certain things, which they thought were no secreties, but either of folly or of envy, accounted them to be ordinary and plain matters. I will relate two or three examples of those former secreties. *Theophrastus* speaking of those herbs that resemble the Scorpion and the Polypus, saith, That some herbs have a peculiar kind of form, as the root of the herb Scorpion, called by some Walwort, and the root of Polypody: for that it is like a Scorpion, and is good against the sting of him; and this is rough, and full of hollow partitions like the Polypus, and is of force to kill him. And in another place he saith, That many things are written of the force of plants, not without just cause;

as for example, to make fruitful and barren; both which, the herb Ragge-wort is forcible unto; for they grow double, a greater and a smaller; the greater helps generation, the smaller hinders it. And this herb is called *Testiculum*. Some herbs are good for procreation of a male, and of one of a female; as the herb which is called *Marifica*, and *Feminipara*; both are like each other: the fruit of the *Feminipara* is like the moil of an Olive-tree; the fruit of the *Maripara* is double like a mans stones. The fruit of white Ivy will make feed barren, but the fruit of *Artemery* will make it fertile; which fruit is a small grain, like to Millet. The leaves of the herb *Harts-tongue* will make a man quite barren, if the herb it self be barren; for there is *Harts-tongue* that bears fruit, and this will make a man fruitful. It is a thing to be noted in a Bur, that a flower grows within the roughness and prickles of it, which doth not shew it self, but conceives and brings forth seed within it self; much like as *Weasils* and *Vipers* do: for they bring forth egges within themselves, and soon after bring forth young ones; so the Bur contains, and cherishes, and ripens the flower within it self, and afterward yeelds fruit. But these things have both the active and passive parts of generation. *Dioscorides* writeth, That the herb *Scorpius* resembleth the tail of the Scorpion, and is good against his bites. So he saith, that the herb *Diagon*, both the greater and the less, is full of speckles like a Serpents hackle, and is a remedy against their hurts: to the herb *Arisaron* in Egypt, and *Wake-robin*, and *Garlick*, bear seeds like a Snakes head; and so *Bugloss* and *Orchaner* bear seeds like a Vipers head; and these are good to heal their venomous bites. Likewise *Stone-crop* and *Saxifrage* are good to break the stone in a mans bladder: and many other such things he there sets down. *Galen* saith, That the Lark hath a crested crown, of the fashion of the herb *Fumitory*, and that either of them is good against the Cholick. *Pliny* hath gathered into his books, many things out of the Ancients works that were extant in his time. We will relate some of them. He saith, That an herb which grows in the head of an Image, being wrapt in a cloth, is good for the Head-ach. Many men have written of Holy-wort: it hath a fie-beetle in the stalk, that runs up and down in it, making a noise like a Kid, (whence it receives the name); and this herb is passing good for the voice. *Orpheus* found out by his wit, the properties of Stones. The stone *Galactites*, in colour like milk, if you cast the dust of it upon the back of a Goat, she will give milk more plentifully to her young; if you give it a nurse in her drink, it encreases her milk. *Chrystal* is like unto water; if one sick of an Ague keep it, and roul it in his mouth, it quenches his thirst. The *Amethyst* is in colour like wine, and it keeps from drunkenness. In the stone *Acharis* you may see fruits, trees, fields and meadows; the powder of it cast about the horns or shoulders of Oxen as they are at plough, will cause great encrease of fruits. The stone *Ophites* resembleth the speckles and spots of Serpents, and it cures their bites. If you dash the stone *Galcoponos*, it sounds like brass: stage-players are wont to wear it, because it makes one have an excellent voice. The stone *Hematites* being rubbed, is like blood, and is good for those that bleed, and for blood-shot eyes; and the stone *Sinoper* is of the same both colour and vertue. The residue I will not here set down, because I have handled them more at large, in that which I have written of the knowledge of Plants.

CHAP. XII.

How to compound and lay things together, by this likeness.

WE have shewed how that Nature layes open the likeness of vertues and properties; now let us shew how to compound and lay those things together: for this is a principle of most use in this faculty, and the very root of the greatest part of secret and strange operations. Wherefore here thou must imitate the exact diligence of the Ancients, studying to know how to

apply and lay things together with their likes, which indeed is the chief matter wherein the most secretaries do consist. It is manifest that every kind of things, and every quality can incline and draw, and allure some things to it, and make them become like it self: and as they are more active, so they more easily can perform it: as for example, fire being very active, doth more easily convert things into it self, and so water into water. *Avicenna* saith, That if any thing stand long in salt, it will become wholly salt; if in an unfavoury vessel, it will become unfavoury: he that converses with a bold man, shall be bold; if with a fearful man, he shall be fearful: and look what living creature converses among men, the same will be tame and gentle. Such positions are usual in Physick; as, All parts of the body, are nourished by their like, the brain by brains, teeth by teeth, lights by lights, and the liver by the liver. A mans memory and wit is holpen by a Hens brain; and her skull, if it be put into our meat whilst it is new, helps the falling-sickness; and her maw, if you eat it before supper, though you hardly digest it, yet is it good to strengthen the stomach. The heart of an Ape, takes away the palpitation of a mans heart, and encreaseth boldnesse, which is seated in the heart. A wolfs yard broiled and minced, is good to eat for the procuring of lust, when strength begins to fail. The skin of a Ravens heel is good against the Gout; the right-heel-skin must be laid upon the right-foot, if that be gouty; and the left upon the left: and finally, every member helps his like. But these things, Physicians write of, whose sayings it is not our purpose here to rehearse. Furthermore, we must consider and be well advised, what things such or such a quality is in; and whether it be there once after a common sort, or else in some great measure; and whether it be an affection, or perturbation; and whether it come by chance, by art, or by nature; as for example, heating, cooling, love, boldnesse, barrennesse, fruitfulness, sadness, babling, or such like; and whether it can cause any such matter as we would work thereby: for examples sake: If you would make a woman fruitful, you must consider with your self the most fertile living-creatures; and amongst the rest, an Hare, a Cony, or a Moule; for an Hare is bigge even after she hath brought forth; she genders every month, and brings not forth all her young at once, but now and then one upon sundry daies, and presently goeth to buck again; and so conceives while she gives suck, and carries in her womb at once, one young that is ripe, another that hath no hairs, and a third that is but lately conceived. Again, you must consider the parts and members where that property lyeth, and minister them to your Patient: as, to make a woman fruitful, you must give her the womb and curd of an Hare; and to the man, the stones of an Hare. In like manner, any particular creature that was never sick, is a help against all diseases. If you would have a man become bold or impudent, let him carry about him the skin or eyes of a Lion or a Cock, and he will be fearless of his enemies; nay, he will be very terrible unto them. If you would have a man talkative, give him tongues, and seek out for him water-frogs, wilde-geese and ducks, and other such creatures, notorious for their continual noise-making; the tongues whereof, if you lay under the head or side of a woman as she is sleeping, because they are most clamorous in the evening, they will make her utter her night-secretaries. Other things we omit, as being superfluous and unprofitable here, seeing we have largely handled them in our books of plants.

CHAP. XIII.

That particular creatures have particular gifts; some in their whole body, others have them in their parts.

PARTICULAR creatures are not destitute of excellent and strange properties, but are very powerful in operation, more then ordinarily their kind yields: and this is by reason either of some hidden property, or rather of the heavenly aspects and influences working diversly in divers particulars, as *Albertus* supposeth, and in one particular more then in most other of the same kind. These sundry effects and inclinations of such particulars, a Magician must also

also be well acquainted with; that knowing sundry ways whereby to work, he may make choice of the fittest, and such as may best serve his present use and need; for this is our task, to teach the way and method of searching out, and applying of secretaries; which done, no further thing can be required of us. Therefore to our purpose, *Albertus* saith, That there were once two twins, one of them would open doors and gates if he did but touch them with his side; and the other would shut them as fast when they were open. Some cannot away to look upon a Cat, a Moule, and such like, but presently they swoon. So, many have the gift from heaven to heal the Kings-evil, and divers other sores: and that which hath troubled much, many Surgeons, and they could not heal it, hath at length been healed only with spittle. Again, we must well consider, what kinds of qualities are incident to what kinds of parties; as, commonly queans are impudent, russians are luxurious, thieves are fearful; and such like passions, as Writers everywhere mention. Moreover, some natural things have not only such properties in themselves, but they are apt also to communicate them unto others. A Harlot is not only impudent in her self, but she also naturally infects therewith, all that she touches and carries about her; so that if a man do often behold himself in her glasse, or put on her garments, it will make him impudent and lecherous as she is. The Load-stone doth not only draw to it self that iron which it touches, but also all iron things near it; the same ring which the Load-stone draws to it self, will draw many rings if they be neer, so that it will be like a chain; the vertue of the Load-stone passing out of one ring into another. And the like may be observed in other things. We must note also, that the vertues of some things are seated in their whole substance; of other things, in some of their parts. The Sea-Lamprey stayeth a Ship, not principally with any one part, but with her whole body. And there be many like examples. On the other side, many things work by some of their parts; as the Cockatrice and the Basilisk, by their eyes; likewise Pismires shun the wings of a Rere-mouse, but her head and heart they do not shun, so they shun the heart of an Houpe, but neither the head, nor yet the wings. The like may be observed in other things.

CHAP. XIV.

Of those properties and vertues which things have while they live; and of such as remain in things after death.

WE must consider that almost all those vertues which are found to be excellent in things while they are alive, do quite perish in death, and seldom are of any force afterward. If the wolf elpy us, his eyes make us dumb; the eyes of the Cockatrice and Basilisk will kill us forth-right; the Sea-lamprey staies the course of a Ship; the Struthio-camelus can digest iron: but none of all the these being dead, worketh ought; for when they perish, their vertues also perish with them. Therefore it is a wise rule in natural Magick, that if a man will work any thing by living creatures, or by any of their parts or properties, he must take the benefit of them while they be alive, for if they die, their vertue dies also. For the soul, saith *Albertus*, is a chief help, and strikes a great stroke in those qualities which are in living creatures; so that they being alive, are endued with many operative vertues, which their death, (especially if it be natural, that their humours are quite wasted) takes from them, as Physicians do much observe. Draw out a frogs tongue, take away from the Ray or Fork-fish his dart, the eyes or stones out of any creatures head, or any such operative thing, not after they are dead, but while they are yet alive, and throw them into the water again, that if it be possible they may live still, lest their vertue should decay, but rather that by their living they might quicken those their natural properties, and so you may work better thereby. And thus we must do in all things else, which I spare to speak of any further. Sometimes yet the properties of things are operative, yet, and that more forcibly, after death. The

Wolf is hurtful and odious to sheep after he is dead : for if you cover a drum with a wolfs skin, the sound of it will make sheep afraid, when most other creatures will not be afraid ; nay, sheep will make a heavy noise, whereas it contrariwise causeth such clamorous creatures as hear it, to hold their peace : so if you cover it with a bears skin, the sound thereof will make hories run away : and if you make harp-strings of all their guts severally, and put them together upon the instrument, they will always jir, and never make any comfort. The beast Hyæna, and the Panther, are naturally at variance ; hence the skin of a dead Hyæna makes the Panther run away : nay, if you hang their severall skins one against the other, the Panthers skin will lose the hairs. So a Lions skin wasteth and eateth out the skins of other beasts ; and so doth the wolfs skin eat up the Lambs skin. Likewise, the feathers of other fowles, being put among Eagles feathers, do rot and consume of themselves. The beast Florus, (it may be the Ais) and the bird Ægithus are at such mortal enmity, that when they are dead, their blood cannot be mingled together. The Pigeon loves the Kaffrel so well, that she loves the Dove-house much the better, where a dead Kaffrel is. In like manner, herbs, and other simples, retain many operative qualities, even after they are dried up. These things must be well considered by a Magician, lest peradventure he be deceived in their working.

CHAP. XV.

That all Simples are to be gotten and used in their certain seasons.

Seeing all inferiours, especially plants, receive their vertue from the heavens, therefore we must have a special care to take them in their due seasons : for as heaven varies the constitutions of the year, so doth it vary plants, they being much nourished by the temperature of the Air ; and the time of the year, as *Theophrastus* saith, is all in all from them. Whence that proverb was justly fetcht, That it is the year, and not the field, which brings forth fruit. Which may be understood two wayes ; either as the vulgar sort mean, or after a more peculiar manner. Concerning the vulgar understanding thereof, *Discorides* sheweth, that we must have a special care both to plant, and to gather all things in their right seasons ; for they are operative onely, as their season is observed, but otherwise of no force. The time of gathering, must be a calm and fair time. If we gather them either too soon or too late, they lose their best vertue. Roots must be plucked up in the fall of the leaf, for then they are fullest, both of moisture and vertue ; their force hiding it self within them when their leaves fall, which lasts long in them, being at that season gathered. Flowers must be gathered in the Spring, because then they have most vertue : and Leaves must be gathered in the Summer. The like we must observe in other things. Know also, that some things lose their vertue quickly, others keep it along time, as experience and the rules of Physick teach us ; that some things may be kept many years, others being long kept, are good for nothing. Whence it cometh, that many experiments prove false, because that which we work by, happily hath lost his vertue, being kept too long. But there are certain peculiar times to gather them in (which the vulgar sort observeth not) wherein the heavenly constellations bestow upon them some singular vertue, proceeding from the most excellent nature and quality of the stars : in which times if they be gathered, they are exceedingly operative. But there can be no set and just time assigned, by reason of the divers situations of divers places in respect of the Sun ; for as the Sun-beams come nearer or further off, so the earth fructifies sooner or later : yet we will give some general observations. Roots are to be gathered betwixt the old Moon and the new : for then the moisture is fallen into the lower parts, and that in the Evening ; for then the Sun hath driven in the moisture, and by the stalk it is conveyed down into the root. The time serves well to gather them, when their wrinkles be filled out with moisture, and they chap because they have so much juice, as if they were about to break in pieces. Leaves are then to be gathered, as soon as they have opened themselves out of the sprigs ; and that in the morning about Sun-rising ; for then they are moister then in the

the evening, the Suns heat having drunk up their moisture all day long. Flowers are then to be gathered, when they begin to feed, while their juice is in them, and before they wax limber. Stalks are then to be gathered, when the flower is withered ; for then especially are they profitable. And seeds must be then gathered, when they are so ripe that they are ready to fall. There are some more peculiar observations. Hot and slender herbs should be gathered when Mars and the Sun are Lords of the celestial houses ; moist herbs, when the Moon is Lord ; but you must take heed that you gather them not in the falling houses thereof. These things well observed in gathering plants, will make them very profitable for Physicall uses.

CHAP. XVI.

That the Countries and places where Simples grow, are chiefly to be considered.

Many are deceived in plants, and metals, and such like, because they use them that come next hand, never heeding the situation of the place where they grow. But he that will work soundly, must well consider, both the aspect of the heavens, and the proper nature and situation of the place ; for the place works diversly in the plants, according to his own divers temperatures ; and sometimes causeth such an alteration in the vertues of them, that many, not onely young Magicians, but good Physicians and Philosophers too, have been deceived in searching them out. *Plato* makes mention hereof : God (saith he) hath furnished the places of the earth with divers vertues, that they might have divers operations into plants and other things according to their kind. And so *Porphyrus* saith, that the place is a principle of a generation, as a father is. *Theophrastus* would have Hemlock gathered and fetch'd from *Susa*, because *Thrafas* was of opinion, that there it might safely be taken, and in other very cold places : for whereas in Athens the juice of it is poison, odious amongst the Athenians, because it is given to kill men in common executions ; and *Socrates* there taking it, died presently ; yet here it is taken without danger, and beasts feed upon it. The herb called Bears-foot, that which grows on the Hill *Oeta* and *Parnassus*, is very excellent ; but elsewhere, of small force : therefore *Hippocrates*, when he would cure *Democritus*, he caused it to be fetch'd from the Hills. And in *Achaia*, especially about *Cabynia*, there is a kind of Vine, as *Theophrastus* saith, the wine whereof causeth untimely births ; and if the dogs eat the grapes, they will bring forth abortives : and yet in the taste, neither the wine, nor the grape, differ from other wines and grapes. He saith also, that those Physicall drugs which grow in *Eubora*, neer unto *Ege*, are good ; but neer to *Telethrium*, which is a shadowed and waterish place, they are much worse and drier. In *Persia* there grows a deadly tree, whose apples are poison, and present death : therefore there it is used for a punishment : but being brought over to the Kings into *Egypt*, they become wholesome apples to eat, and lose their harmfulnesse, as *Columella* writes. *Discorides* saith, That the drugs which grow in steep places, cold and dry, and open to the winde, are most forcible ; but they that grow in dark, and waterish, and calm places, are lesse operative. Wherefore if we find any difference in such things, by reason of the places where they grow, that they have not their right force, we must seek them out there where the place gives them their due vertue.

CHAP. XVII.

Certain properties of Places and Fountains, which are commodious for this work.

Difference of places, works much in the different effects of things. For the place of the waters, and also of the earth, hath many miraculous vertues, which a Magician must needs be well acquainted with : for oft-times we see, that some things are strangely operative, onely by reason of the situation of the place, the disposition of the Air, and the force of the Sun, as it cometh nearer or further off. If

one ground did not differ from another, then we should have odoriferous reeds, rushes, gaffie, frankincense, peper, and myrrh, not only in Syria and Arabia, but in all other Countries also. Likewise many properties are derived out of Waters and Fountains; which otherwise could not be made, but that the waterish humor in the earth, conveys his scent and such like properties, into the root of that which there groweth, and so nourisheth up that matter which springs out, and causeth such fruit as favours of the place, according to his own kind. Zama is a City in Africa, and Ismuc is a Town twenty miles from it: and whereas all Africk besides, is a great breeder of beasts, especially of serpents, about that Town there breed none at all; nay, if any be brought thither, it dies: and the earth of that place also killeth beasts, whithersoever it is carried. In the great Tarquine Lake of Italy, are seen Trees, some round, some triangle, as the wind moves them; but none four-square. In the Country beyond the River Po, that part which is called Monstera, there is a kind of Corn called Siligo, which being thrice sown, makes good bread-corn. Neer to Harpajum a Town of Asia, there is a huge Rock, which if you touch with one finger, will move; if with your whole body, it will not move. There are some places of the earth that are full of great fires, as Aetna in Sicily, the Hill Chimara in Phaelis; the fire whereof *Ctesius* writes, will be kindled with water, and quencht with earth. And in the Country of Megalopolis, and the fields about Arcia, a coal falling on the earth, sets it on fire. So in Lycia, the Hills Ephesi being touched with a Torch, flame out, inasmuch that the stones and sands there do burn in the waters; wherein if a man make a gutter with a staff, he shall see Rivers of fire run therein. The like things are reported of waters. For seeing they passe under the earth, through veins of allum, pitch, brimstone, and such like; hence it is that they are sometimes hurtful, and sometimes wholesome for the body. There are also many kinds of water, and they have divers properties. The River Himera in Sicily, is divided into two parts: that which runs against Aetna, is very sweet, that which runneth through the salt veins, is very salt. In Cappadocia, betwixt the Cities Mazaca, and Tuava, there is a Lake, whereinto if you put reeds or timber, they become stones by little and little, and are not changed from stones again, neither can any thing in that water be ever changed. In Hierapolis, beyond the River Maender, there is a water that becomes gravel, so that they which make water-courses, raise up whole banks thereof. The Rivers Cephises and Melas in Beotia, if cattel drink of them, as they do continually to make them conceive, though the dams be white, yet their young shall be russet, or dun, or coal-black. So the sheep that drink of the River Peneus in Thessaly, and Aftax in Pontus, are thereby made black. Some kinds of waters also are deadly, which from the poisonous juice of the earth become poisonous; as the Well of Terracina called Neptunius, which kills as many as drink of it; and therefore in old times it was stopp'd up. And the Lake Cychros in Thracia, kills all that drink of it, and all that wash themselves with it. In Nonacris, a Country of Arcady, there flow very cold waters out of a stone, which are called the water of Styx, which break to pieces all vessels of silver and brass; and nothing can hold them but a Mules hoof, wherein it was brought from *Anipater*, into the Country where *Alexander* was, and there his Son *Jolla* killed the King with it. In the Country about Flacon, the way to Campania, in the field Cornetum, there is a Lake with a Well in it, wherein seem to lie the bones of Snakes, Lyards, and other Serpents; but when you would take them out, there is no such thing. So there are some sharp and fowre veins of water, as Lyncesto, and Theano in Italy; which I sought out very diligently, and found it by the way to Rome, a mile from Theano; and it is exceeding good against the Stone. There is a Well in Paphlagonia, whosoever drinks of it, is presently drunken. In Chios is a Well, that makes all that drink of it, foolish and senseless. In Susa is a Well, who drinks of it, loseth his teeth. The water of Nilus is so fertile, that it makes the clods of earth to become living creatures. In Aethiopia is a Well, which is so cold at noon, that you cannot drink it; and so hot at midnight, that you cannot touch it. There are many other like Wells, which *Ovid* speaks of: *Ammons* Well is cold all day, and warm both morning and evening: the waters of Athamas, set wood on fire, at the fall of the

Moon:

Moon: there is a Well where the Cicones inhabit, that turneth into stones all that toucheth it, or drinks of it; Crathis and Sybaris make hair shew like Amber and Gold; the water of Salmax, and the Aethiopian Lakes, make them mad or in a trance that drink of it; he that drinks of the Well Clitorius, never cares for wine after; the River Lyncestius makes men drunken; the Lake Pheneus in Arcady, is hurtful if you drink it by night; if by day, it is wholesome. Other properties there are also of places and fountains, which he that would know, may learn out of *Theophrastus*, *Tinamus*, *Possidonius*, *Hegesias*, *Herodotus*, *Aristides*, *Meliodorus*, and the like, who have very diligently sought out, and requir'd the properties of places; and out of them, *Pliny*, *Solinus*, and such Writers have gathered their books.

CHAP. XVIII.

That Compounds work more forcibly; and how to compound and mix those Simples which we would use in our mixtures.

NOW we will shew how to mix and compound many Simples together, that the mixture may cause them to be more operative. *Proclus* in his book of Sacrifice and Magick, saith, That the ancient Priests were wont to mix many things together, because they saw that divers Simples had some property of a God in them, but none of them by it self sufficient to resemble him, Wherefore they did attract the heavenly influences by compounding many things into one, whereby it might resemble that One which is above many. They made images of sundry matters, and many odors compounded artificially into one, so to expresse the essence of a God, who hath in himself very many powers. This I thought good to aildge, that we may know the Ancients were wont to use mixtures, that a compound might be the more operative. And I my self have often compounded a preservative against poison, of Dragon-herbs, the Dragon-fish, Vipers, and the stone Ophites; being led therein by the likeness of things. The herb Dragon-wort, both the greater and smaller, have a stalk full of sundry-coloured specks; if any man eat their root, or rub his hands with their leaves, the Viper cannot hurt him. The Dragon-fish being cut and opened, and laid to the place which he hath stung, is a present remedy against his sting, as *Arimus* writes. The Viper it self, if you slay her, and strip off her skin, cut off her head and tail, cast away all her entrails, boil her like an Eele, and give her to one that she hath bitten, to eat, it will cure him: or if you cut off her head being alive, and lay the part next the neck, while it is hot, upon the place which she hath bitten, it will strangely draw out the poison. Many such compound medicines made of creatures living on the earth, in the water, in the air, together with herbs and stones, you may find most wittily devised, in the books of *Kiraxnides* and *Harprocraton*. But now we will shew the way and manner how to compound Simples, which the Physicians also do much observe. Because we would not bring forth one effect only, but sometimes have use of two or three, therefore we must use mixtures, that they may cause sundry effects. Sometime things will not work forcibly enough, therefore to make the action effectual, we must take unto us many helps. Again, sometime they work too strongly, and here we must have help to abate their force. Oft-times we would practice upon some certain member, as the head, the heart, or the bladder; here we must mingle some things which are directly operative upon that part, and upon none else; whereby it falleth out, that sometimes we must meddle contraries together. But to proceed. When you would do any work, first consider what is the chief thing which your simple or compound should effect; then take the ground or foundation of your mixture, that which gives the name to your compound, and let there be so much of it, as may proportionably work your intent; for there is a just and due quantity required for their working; then put in the other ingredients, as sauce and seasoning, to help the principal to work more easily and in due time. So we mingle sweet things with unfavoury, and with bitter, that it may smell and taste well: for if we should mingle onely unfavoury and bitter receipts, they that we give it unto would loath it, and their animal spirits would so abhor it, that though they took

it,

it, yet it could not work in them. So we meddle soft and hard things together, that they may go down more pleasantly. Sometimes there is so little in a receit, that the heat of the body wastes it before it can work; here then is required a greater quantity: for, this doth not hinder the working, but gives the natural heat some-what to feed upon, that in the mean space the receit may have fit time to work. As for example: If we would catch birds by bringing them to sleep, here we must take the Nut Merhella, which is of that force, as to cause sleep and heaviness of brain; and let this be the ground of our mixtion: then to make it more lively in working, put thereto the juice of black Poppie, and the dregs of wine: If it be too hard, and we would have it more liquid, that so it may fill out the pulse or other baits, which we lay for them; put thereto the juice of Mandrakes, and Hemlock, and an Ox gall: and that it may not be bitter or unfavoury, put hony, cheele or floure amongst it, that so it may be fitter to be eaten: and when once the birds have tasted of it, they lie down to sleep on the ground, and cannot flie, but may be taken with hands. The like must be observed in other things.

CHAP. XIX.

How to find out the just weight of a mixture.

WE must also have a special care to know the right ministring of a compound, and how to find out the just proportion of weight therein; for the goodness of the operation of things, consists chiefly in the due proportion and measure of them: And unless the mixtion be every way perfect, it availeth little in working. Wherefore the Ancients were wont to observe not only in compounds, but also in Simples due weight and measure; and their experience hath left it unto us. If then thou bestowest thy pains in this faculty, first thou must find out the weight of a simple Medicine, how much of it would serve such a purpose as thou intendest; and to that, thou must proportionably frame thy compound, observing a due proportion, both in the whole and every part thereof. Let thy chief Simple, the ground of thy mixture, be half the weight, and the other ingredients altogether must be the other half; but how much of each of these other ingredients, that thou must gather by thy own conjecture: So then, thy whole compound must be but as much as if it were onely a simple receit; for we do not compound things, to make the receit greater, either in quantity or in vertue, but only because it should be more speedy in operation: It must also be considered, that the weights of mixtures and medicines must vary proportionably, as the Countries and Climates vary: for this alters their operation, as we shewed before. Thou must therefore work advisedly; and as the operation of the Simples altereth, so thou must alter their weight, by putting to, and taking from, and wittily fitting all things, that they may effect that which thou wouldest. This is the reason, why in our experiments which we have set down hereafter, we have described the parts thereof by their severall weights: and lest the divers names of weights should hinder thy working, we have used those weights and names which *Cornelius Celsus* used before us: for so it is fittest for all mens satisfaction.

CHAP. XX.

How to prepare Simples.

HAVING shewed the way how to compound and find out the just weight of our Composition, it now remains we teach how to prepare Simples; which is a matter chiefly necessary for this work; and greatest skill is seen in it. For the operations of Simples, do not so much consist in themselves, as in the preparing of them; without which preparation, they work little or nothing at all. There be many wayes to prepare Simples, to make them fitter for certain uses. The most usual wayes are, Steeping, Boiling, Burning, Pawning, Resolving into ashes, Distilling, Drying, and such like. To macerate or steep any thing, is to drench and to
soak

soak it in liquor, that it may be thoroughly wet both within and without, so that the more subtil and intimate part of it may be drained and squeezed out, and the grosser and earthly part be left behind, to receive that humour in the very middle, which we would have in it. Boiling we then use, when we cannot otherwise well get out the juice of any thing: for by boiling we draw out of the centre into the circumference, when we cannot do it by steeping; to roste, to pown things, that the slighter vapours may be resolved. So we use to burn, to roste, to pown things, that we may take away all their moisture from them; for by this means, they may the more easily be resolved, and the sooner converted into liquor, and the better mingled with other things to be put to them. So we roste or broil things when otherwise we cannot break them, that they might become dust; yet alwayes we must take heed that we do not so burn them, as they may lose their strength; nor to boil things but only as they may be fitter to receive that subtil humor and quality, which we would convey into them. Distillation of things is used, as well to get out water that may be of greater strength, thereby to work more easily & handiely; as also because the slighter and more subtile parts of Medicines are fittest for us, the grosser parts must be cast away, as being an hindrance to our purpose: and the like we must conceive of other operations. These things I thought fittest for this work. He that would be instructed more at large herein, let him look into the books of Physicians. But let us now proceed to further matters.



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The



THE
SECOND BOOK
OF
Natural Magick :

Shewing how living Creatures of divers kinds, may be mingled and coupled together, that from them, new, and yet profitable kinds of living Creatures may be generated.

THE PROEM.

HAVING wandred beyond my bounds, in the consideration of Causes and their Affections: which I thought fit to make the Subject of my first book: it will be time to speak of those Operations, which we have often promised, that we may not too long keep off from them those ingenious men that are very desirous to know them. Since that we have said, That Natural Magick is the top, and the compleat faculty or Natural Science, in handling it, we will conclude within the compass of this Volume, whatsoever is High, Noble, Choice, and Notable, that is discovered in the large field of Natural History. But that we may perform this, I shall reduce all those Secrets into their proper places; and that nothing may be thrust out of its own rank, I shall follow the order of Sciences. And I shall first divide them into Natural and Mathematical Sciences; and I shall begin with the Natural; for I hold that most convenient, that all may arise from those things that are simple, and not so laborious, to Mathematical Sciences. I shall from Animals first proceed to Plants, and so by steps to Minerals, and other works of Nature. I shall briefly describe Fountains, also whence flow Springs; and I shall annex thereto the Reasons, and the Causes; that Industrious men made acquainted with this, may find out more of themselves. And because there are two generations of Animals and Plants, one of themselves, the other by copulation: I shall first speak of such as are bred without copulation; and next, of such as proceed from copulation one with another, that we may produce new living Creatures, such as the former ages never saw. I shall begin therefore with Putrefaction, because that is the principle to produce new Creatures; not onely from the variety of Simples, but of mixed Bodies. I thought fit to leave none out, though they be of small account, since there is nothing in Nature, appear it never so small, wherein there is not something to be admired.

CHAP. I.

The first Chapter treateth of Putrefaction, and of a strange manner of producing living Creatures.



BEFORE we come to shew that new living Creatures are generated of Putrefaction, it is meet to rehearse the opinions of ancient Philosophers concerning that matter. Whereof though we have spoken elsewhere, in the description of Plants, yet for the Readers ease, we will here rehearse some of them, to shew that not onely imperfect, but perfect living Creatures too, are generated of Putrefaction. Porphyry thought that Living creatures were begotten of the bowels of the Earth soaked in water, and quickned by the heat of the Sun. Of the same mind were Archelaus the Athenian, Anaxagoras Clazomenus, and Euripides his Scholar. Cleodemus, and after him Theophrastus, thought that they came of purified wa-

Of the Generation of Animals.

ter mixt with earth; and the colder and fouler the water was, the unfitter it was for their generation. Diodorus, and many other good Philosophers hold, that all living Creatures did arise of putrefaction. For whereas in the beginning of the world, the Heavens, and Earth, and Elements were settled in their natural places, the earth being left slumy and loit in many places, and then dried and stricken with the heat of the sun, brought forth certain tumors and swellings in the surface and uppermost parts: in these tumors were contained and cherished many putrefactions and rotten clouds, covered over with certain small skins; this purified fluff, being moistened with dew by night, and the Sun heating it by day, after a certain season became ripe; and the skins being broken, thence issued all kinds of living Creatures; whereof, they that had quickest heat, became birds; the earthy ones became creeping beasts; the waterish ones became fishes in the Sea; and they which were a mean, as it were, betwixt all these, became walking-creatures. But the heat of the Sun still working upon the earth, hindered it from begetting and bringing forth any more such creatures, but then, the creatures before generated coupled together, and brought forth others like themselves. Avicenna, in that work of his which he made of deluges and floods; holds, that after the great floods that drowned the Earth, there was no mans seed; but then, man, and all living Creatures else, were generated of rotten carcases, only by the virtue of the Sun: and therefore he supposeth, that the womb, and such needful places framed by nature, for the better fashioning of the infant, are not needfull to the procreation of man. He proves his assertion by this, that mice, which arise of putrefaction, do couple together, and beget store of young; yea, and serpents are generated chiefly of womans hair. And in his book of living Creatures, he tels of a friend of his, that brought forth Scorpions after a strange manner, and those did beget other Scorpions, nor imperfect, or unlike to themselves, but such as did also procreate others. Averroes held, that the stars were sufficient to generate imperfect creatures; as mice, bats, moles, and such like, but not to generate Men, or Lions. And daily experience teacheth us, that many living creatures come of the purified matter of the earth. And the Ancients supposing all things to be produced out of the earth, called it the mother of all; and the Greeks called it Dimiters. Ovid hath very elegantly set down this generation of putrefaction, under the fable of Pyrrha; that the earth brought forth of its own accord, many living creatures of divers forms, the heat of the Sun enlivening those moistures that lay in the tumors of the earth, like fertile seeds in the belly of their mother; for heat and moisture being tempered together, caueth generation. So then, after the deluge, the earth being now moist, the Sun working upon it, divers kinds of creatures were brought forth, some like the former, and some of a new shape.

CHAP. II.

Of certain earthly Creatures, which are generated of putrefaction.

PLANTS and living Creatures agree both in this, that some of them are generated of seed, and some of them Nature brings forth of her own accord, without any seed of the same kind: some out of purified earth and plants, as those Creatures that are divided between the head and the belly; some out of the dew that lies upon leaves, as Canker-worms; some out of the mud, as shell-creatures; and some out of living Creatures themselves, and the excrements of their parts, as lice. We will onely rehearse some which the Ancients have set down, that so we may also learn how to procreate new creatures. And first, let us see, how

Mice are generated of putrefaction.

Diodorus saith, that neer to the City Thebais in Egypt, when Nilus overflowing is past, the Sun heating the wet ground, the chaps of the earth send forth great store of mice in many places; which astonisheth men to see, that the fore-part of the mice should live and be moved, whereas their hinder parts are not yet shapen. *Pliny* saith, that after the swaging of Nilus, there are found little mice begun to be made of earth and water, their fore-parts living, and their hinder parts being nothing but earth. *Alianus* saith, that a little rain in Egypt, engenders many mice, which being scattered everywhere in their fields, eat down their corn, and devour it: And so it is in Pontus; but by their prayers to God, they are consumed. *Macrobius* and *Avicenna* say, that the mice so generated, do encrease exceedingly by coupling together. *Aristotle* found out, that a kind of field-mice encrease wonderfully; so that in some places they did suddenly eat up whole fields of corn: insomuch that many Husband-men appointing to reap their corn on the morrow, when they came with their reapers, found all their corn wasted. And as these mice are generated suddenly, so they are suddenly consumed, in a few dayes; the reason whereof cannot be so well assigned. *Pliny* could not find how it should be; for neither could they be found dead in the fields, neither alive within the earth in the winter time. *Diodorus* and *Alianus* write, That these field-mice have driven many people of Italy out of their own Countrey: they destroyed Cosas, a City of Hetruria: many came to Troas, and thence drove the inhabitants. *Theophrastus* and *Varro* write, That mice also made the inhabitants of the Island Gyarus to forsake their Countrey; and the like is reported of Heraclea in Pontus, and of other places. Likewise also

Frogs are wonderfully generated of rotten dust and rain;

for a Summer showre lighting upon the putrified sands of the shore, and dust of high-ways, engenders frogs. *Alianus*, going from Naples in Italy, to Puteoli, saw certain frogs, that their fore-parts moved and went upon two feet, while yet their hinder parts were unfashioned, and drawn after like a clot of dirt: and *Ovid* saith, one part lives, the other is earth still: and again, mud engenders frogs that sometimes lack feet. The generation of them is so easie, and sudden, that some write it hath rained frogs; as if they were generated in the Air. *Phylarchus* in *Athenaeus* writes so; and *Heracides Lembus* writes, that it rained frogs about Dardany and Pconia, so plentifully, that the very wayes and houses were full of them: and therefore the inhabitants, though for a few daies at the first they endured it, killing the frogs, and shutting up their houses, yet afterward when they saw it was to no purpose, but they could neither use water, nor boil meat, but frogs would be in it, not so much as tread upon the ground for them, they quite forsook their countries, as *Diodorus* and *Eusebium* write. The people Autharidæ in Theopratia, were driven out of their Countrey, by certain imperfect frogs that fell from heaven. But it is a strange thing that

Rgd Toads are generated of dirt, and of womens flowers.

In Dariene, a Province of the new world, the air is most unwholesome, the place being muddy and full of stinking marshes; nay, the village is it self a marsh, where Toads are presently generated of the drops wherewith they water their houses, as *Peter Martyr* writes. A Toad is likewise generated of a duck that hath lyen rotting under the mud, as the verse shews which is ascribed to the duck: When I am rotten in the earth, I bring forth Toads: happily because they and I both, are moist and foul creatures. Neither is it hard to generate Toades of womens putrified flowers; for women do breed this kind of cattel, together with their children, as *Celius Aurelianus* and *Platarius* call them, frogs, toads, lyzards, and such like: and the women of Salernum, in times past, were wont to use the juice of Parsley and Leeks, at the beginning of their conception, and especially about the time of their quickening, thereby to destroy this kind of vermin with them. A certain

WOMAN

woman lately married, being in all mens judgement great with child, brought forth in stead of a child, four Creatures like to frogs, and after had her perfect health. But this was a kind of a Moon-calf. *Paracelsus* saith, that if you cut a serpent in pieces, and hide him in a vessel of glass, under the mud, there will be generated many worms, which being nourished by the mud, will grow every one as big as a Serpent; so that of one serpent may be an hundred generated: and the like he holds of other creatures. I will not gainsay it, but only thus, that they do not gender the same serpents. And so, he saith, you may make them of a womans flowers; and so, he saith, you may generate a Basilisk, that all shall die which look upon him: but this is a fable lie. It is evident also, that

Serpents may be generated of mans marrow, of the hairs of a menstruous woman, and of a horse-tail, or mane.

We read, that in Hungary, by the River Theisa, Serpents and Lyzards did breed in mens bodies, so that three thousand men died of it. *Pliny* writes, that about the beginning of the wars against the Marfi, a maid-servant brought forth a serpent. *Avicenna* in his book of deluges, writes, that serpents are gendered of womens hairs especially, because they are naturally moister and longer then mens. We have experienced also, that the hairs of a horses mane laid in the waters, will become serpents: and our friends have tried the same. No man denies but that serpents are easily gendered of mans flesh, especially of his marrow. *Alianus* saith, that a dead mans back-marrow being putrified, becomes a serpent: and so of the meekest living Creature arises the most savage: and that evil mens back-bones do breed such monsters after death; *Ovid* shews, that many hold it for a truth. *Pliny* received it of many reports, that Snakes gendered of the marrow of mens backs. Writers also shew,

How a Scorpion may be generated of Basil.

Florentinus the Grecian saith, That Basil chewed and laid in the Sun, will engender serpents. *Pliny* addeth; that if you rub it, and cover it with a stone, it will become a Scorpion; and if you chew it, and lay it in the Sun, it will bring forth worms. And some say, that if you stamp a handful of Basil, together with ten Crabs or Crevises, all the Scorpions thereabouts will come unto it. *Avicenna* tells of a strange kind of producing a Scorpion; but *Galen* denies it to be true. But the body of a Crab-fish is strangely turned into a Scorpion: *Pliny* saith, that while the Sun is in the sign Cancer, if the bodies of those fishes lie dead upon the Land, they will be turned into Scorpions. *Ovid* saith, if you take off the Crabs arms, and hide the rest in the ground, it will be a Scorpion. There is also a

Creature that lives but one day, bred in vinegar;

as *Alianus* writes; and it is called Ephemerus, because it lives but one day: it is gendered of the dregs of fowre wine; and as soon as the vessel is open, that it comes into the light, presently it dies. The River *Hipparis*, about the solstitial daies, yields certain little husks, whence issue forth certain four-footed birds, which live and flie about till noon, but pine away as the Sun draws downward, and die at the Sun-setting; and because they live but one day, they are called Hemerobion, a daies-bird. So the

Pyrgones be generated in the fire;

Certain little flying beasts, so called, because they live and are nourished in the fire; and yet they flie up and down in the Air. This is strange; but that is more strange, that as soon as ever they come out of the fire, into any cold air, presently they die. Likewise the

Salamander

Salamander is gendred of the water;

for the Salamander it self genders nothing, neither is there any male or female amongst them, nor yet amongst Eels, nor any kind else; which doth not generate of themselves either egge or young, as *Pliny* noteth. But now we will speak of a most excellent generation, namely, how

Bees are generated of an Ox.

Ælianus writes, That Oxen are commodious many ways; amongst the rest, this is one excellent commodity, that being dead, there may be generated of them a very profitable kind of Creatures, namely Bees. *Ovid* saith it, that as all-purified bodies are turned into some small living Creatures, so Oxen purified do generate Bees. *Florentinus* the Grecian saith, that *Jubas* King of Africa, taught how to make Bees in a wooden Ark. *Democritus* and *Varro* shew a cruel manner of making Bees in a house: but it is a very ready way. Choose a house ten cubits high, and ten cubits broad, square every way: but let there be but one entrance into it, and four windows, on each side one. Put in this room an Ox, about two or three years old; let him be fat and fleshy: then set to him a company of lusty fellows, to beat him so cruelly, that they kill him with their cudgels, and break his bones withal: but they must take great heed that they draw no blood of him, neither must they strike him too fiercely at the first: After this, stop up all the passages of the Ox, his nostrils, eyes, mouth, and necessary places of evacuation, with fine linen clouts besmeared with pitch: Then cast a great deal of honey under him, being laid with his face upwards, and let them all go forth, and daube up the door and the windows with thick lome, so that no wind, nor Air can get in. Three weeks after, open the room, and let the light and the Air come in, except there where the wind would blow in too violently. And when you see that the matter is through cold, and hath taken air enough, then shut up the door and windows as before. About eleven daies after, open it again, and you shall find the room full of Bees clotted together, and nothing of the Ox remaining, beside the horns, the bones and the hair. They say that the Kings of the companies are generated of the brain, the other of the flesh, but the chief Kings of all, of the marrow; yet those that come of the brain, are most of them greater, handsomer, and better-coloured than the rest. When you open the room first, you shall find the flesh turned into small, white, and unperfect creatures, all of the same shape, but as yet only growing, and not moving. Afterward, at the second opening, you may see their wings grown, the right colour of Bees in them, and how they fit about their Kings, and flutter about, especially toward the windows, where they would enjoy their desired light. But it is best to let them light by the windows every other day. This same experiment, *Virgil* hath very elegantly set down in the same manner. Now as the best kind of Bees are generated of a young Ox, so a more base kind of them is brought forth of the dead flesh of baser creatures; *Ælianus* saith,

That Waspes are generated of an Horse;

when his carcase is purified, the marrow of him brings forth Waspes; a swift kind of fowl, from a swift kind of beast. *Ovid* saith, that Hornets are thence generated; and *Isidore* derives *crabronem à cabo, id est caballo*, a hornet of a horse, because they are brought forth of horses. *Pliny* and *Virgil* say, that waspes and hornets both, are generated of the flesh of dead horses. In like manner

Drones come of Mules,

Of the Generation of Animals.

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as *Isidore* affirmeth: and the Drone is called *Fucus quasi Fages*, because he eats that which he never laboured for. But others hold that Locusts, and not Drones, are generated of Mules flesh. So also, of the basest beast cometh the basest fowl:

The Beetle is generated of the Ass,

as *Pliny* writes. *Isidore* saith, they come of swift dogs: *Ælianus* saith, they have no female, but lay their feed in a clot of earth for 28 dayes, and then bring forth young out of it.

CHAP. III.

Of certain Birds, which are generated of the Putrefaction of Plants.

Olaus Magnus, in the description of the North-countries of Europe, reports, that about Scotland, there be certain birds generated of the fruit of a Tree. *Musler* saith, there be certain Trees which bring forth a fruit covered over with leaves; which, if it fall into the water under it, at the right season, it lives, and becomes a quick bird, which is called *Avi arborea*. Neither is this any new tale; for the ancient Cosmographers, especially *Saxo Grammaticus* mentions the same Tree. Late Writers report, That not onely in Scotland, but in the River of Thames also by London, there is a kind of Shel-fish in a two-leaved shell, that hath a foot full of plaits and wrinkles: these fish are little, round, and outwardly white, smooth and brittle shelled, like an Almond shell; inwardly they are great bellied, bred as it were of moss and mud: they commonly stick on the keel of some old Ship, where they hang together like Mushrome-stalks, as if they were thereby nourished. Some say, they come of worms, some of the boughs and branches of Trees which fall into the Sea; if any of these be cast upon shore, they die; but they which are swallowed still into the Sea, live, and get out of their shell, and grow to be ducks or such like birds. *Gesner* saith, that in the Islands Hebrides, the same

Birds are generated of putrified wood.

If you cast wood into the Sea, first after a while there will certain worms breed in it, which by little and little become like ducks, in the head, feet, wings and feathers; and at length grow to be as big as Geese: and when they are come to their full growth, they flie about in the Air, as other birds do. As soon as the wood begins first to be putrified, there appears a great many worms, some unshapen, others being in some parts perfect, some having feathers, and some none. *Paracelsus* saith; As the yelk and white of an egge, becomes a chick by the heat of an Hen; so a bird burnt to ashes, and shut up in a vessel of glaie, and so laid under the mixen, will become a slimy humour; and then, if it be laid under a Hen, is enlived by her heat, and reitored to her self like a Phoenix. *Ficinus* reporteth, and he had it out of *Alberus*, That there is a certain bird, much like a Black-bird, which is generated of the putrefaction of Sage; which receives her life and quickning from the general life of the whole world.

CHAP. IV.

Of Certain fishes which are generated of putrefaction.

HAVING first spoken of earthly Creatures, and then of Fowles; now we will speak of Fishes so generated. And first how

Eels are generated.

Amongst them there is neither male or female, nor egges, nor any copulation; neither

ther was there ever seen in any of them, any passage fit to be a womb. They have bred oft-times in certain muddy pools, even after all the water and mud hath been gone; only by rain-water: neither indeed do they ever breed without rain, though they have never so much water otherwise; for it is the rain, both that begets and nourishes them, as *Aristotle* writes. They are also generated of purified things. Experience hath proved, that a dead horse thrown into a standing pool, hath brought forth great store of Eeles; and the like hath been done by the carcases of other creatures. *Aristotle* saith, they are generated of the garbage of the earth, which he saith, ariseth in the Sea, in Rivers, and in pools, by reason chiefly of putrefaction; but it arises in the Sea by reason of reeds; in Pools and Rivers, it arises by the banksides; for there the heat is more forcible to cause putrefaction. And a friend of mine filled certain wooden vessels with water, and Reeds, and some other water-herbs, and set them in the open Air, having first covered them with a weighty stone, and in short time generated Eeles. Such is the generation of

Groundlings out of some and froth,

which fish the Greeks call *Aphya*, because rain breeds it. Many of them breed of the foam that rises out of the sandy chanel, that still goes and comes at all times, till at last it is dissolved; so that this kind of fish breeds all times of the year, in shady and warm places, when the soyl is heated; as in Attica, neer to Salamina, and in Marathon, where *Themistocles* got his famous victory. In some places, this fish breeds of foam by the help of the rain; and swims on the top of the water in the foam, as you see little wormes creep on the top of mud. *Athenius* saith, This fish is consecrated to *Venus*, because the also comes of the froth of the Sea, whence she is called *Aphrodites*. *Plinius* saith, These fishes neither do beget, nor are begotten, but only come of mud: for when dirt is clotted together in the Sea, it waxes very black and slimy, and then receives heat and life after a wonderful manner, and so is changed into very many living Creatures, and namely into Groundlings. When the waves are too boisterous for him, he hides himself in the cleft of some rock; neither doth he need any food. And *Oppianus* makes the very same description of them, and of their generation. There is a kind of these fishes, called a Muller-Groundling, which is generated of mud and of sand, as hath been tried in many marshy places, amongst the rest in Gindus; where in the Dog-daies, the Lakes being dried up, so that the mud was hard, as soon as ever they began to be full of rain-water again, were generated little fishes, a kind of Mullers, about the bigness of little Cackrels, which had neither seed nor egge in them. And in some parts of Asia, at the mouth of the Rivers into the Sea, some of a bigger size are generated. And as the Muller-groundling comes of mud, or of a sandy lome, as *Aristotle* writes; so it is to be thought, that the Cackrel-groundling comes thereof also. It seems too, that

A Carpe is generated of putrefaction,

Especially of the purified mud of sweet water: for it is experienced, that in certain Lakes, compassed about with Hills, where there is no Well, nor River, to moisten it, but only the rain, after some few showers, there hath been great store of fish, especially Carpes: but there are some of this kind generated by copulation. There are also in certain particular Lakes, particular kinds of fishes, as in the Lemane, and the Benacian Lakes, there be divers kind of Carpes, and other such fishes. Likewise there are certain

Earthly fishes generated of putrefaction.

Pliny reports, that in Paphlagonia, they dig out of deep ditches, certain earthly fishes very good to be eaten; and it is so in places where there is no standing water; and he wonders that they should be generated without copulation: but surely

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ly it is by virtue of some moisture, which he ascribes to the Wells, because in some of them fishes are found. Likewise

Shel-fish are generated of the frothy mud,

or else meerly of the salt-water; for they have neither seed, nor male, nor female; the hardness and closeness of their shels, hindering all things from touching or rubbing their inward parts, which might be fit for generation. *Aristotle* saith, they breed all of themselves; which appears by this, that oft-times they breed in Ships, of a frothy mud purified: and in many places, where no such thing was before, many shel-fishes have bred, when once the place waxed muddy, for lack of moisture. And that these fishes emit no seed or generative matter, it appears, because that when the men of Chios had brought out of Lesbos many Oysters, and cast them into Lakes neer the Sea, there were found no more then were cast in; onely they were somewhat greater. So then Oysters are generated in the Sea, in Rivers and in Lakes, and therefore are called *Limnosires*, because they breed in muddy places. *Oppianus* writes also, that they have neither male nor female, but are generated of themselves and their own accord, without the help of any copulation. So the fish called *Orti-ca*, and the Purple, and Mulcles, and Scallops, and Perwinkles, and Limpins, and all Shel-fish are generated of mud: for they cannot couple together, but live only as plants live. And look how the mud differs, so doth it bring forth different kinds of fishes: dirty mud genders Oysters, sandy mud Perwinkles, the mud in the Rocks breedeth *Holoturia*, *Lepades*, and such-like. Limpins, as experience hath shewed, have bred of rotten hedges made to stink by; and as soon as the hedges were gone, there have been found no more Limpins.

CHAP. V.

That new kinds of living Creatures may be generated of divers beasts, by carnal copulation.

WE have shewed that living Creatures are generated of putrefaction: now we will shew, that sundry kinds of beasts coupling together, may bring forth new kinds of Creatures, and these also may bring forth others; so that infinite monsters may be daily gendred: for whereas *Aristotle* saith, that Astrick alwayes brings forth some new thing; the reason thereof is this, because the Country being in most places dry, divers kinds of beasts come out of sundry quarters thither, where the Rivers were, and there partly for lust, and partly by constraint, coupled together, and so gendred divers monstrous Creatures. The Antients have set down many such generations, and some are largely devised, or found out by chance; and what may be hereafter, let men of learning judge. Neither let the opinions of some Philosophers stay us, which hold that of two kinds divers in nature, a third cannot be made, unlike to either of the parents; and that some Creatures do not gender at all, as Mules do not: for we see, that, contrary to the first of these their positions, many Creatures are generated of kinds divers in nature, and of these are generated others, to the perpetual conservation of this new kind; as hath been tried in many Villages, that divers kinds coupling together, have brought forth other new kinds, differing from their progenitors every day more and more, as they multiply their copulations, till at length they are scarce in any thing like the former. And against their second Position, we must not think that the one example of Mules not gendring, should prejudice the common course of other creatures. The commitions or copulations, have divers uses in Physick, and in Domestical affairs, and in hunting: for hereby many properties are conveyed into many Creatures. First, we will rehearse those experiments, which the Antients have described, and then those which new Writers have recorded, and our selves have seen in divers Countries. And by this, the ingenious Reader may find out others. But first I will relate certain observations, which *Aristotle* and others have prescribed, that this kind of generation may be more easily wrought,

wrought. First, the creatures thus coupled, must be of an equal pitch; for if there be great odds in their bignesse, they cannot couple: a dog and a wolf, a Lion and a Panther, an Ass and a Horse, a Partridge and a Hen, are of one bignesse, and therefore may couple together; but a Horse and a Dog, or a Mare and an Elephant, or a Hen and a Sparrow cannot. Secondly, they must have one and the same place to bring forth in: for if one of them bring forth in twelve moneths, and the other in six, then the young will be ripe by one side, when it is but half ripe by the other. A dog must have two moneths, and a horse must have twelve: and the Philosopher saith, no creature can be born, except he have his full time. So then a dog cannot be born of a man, nor a Horse of an Elephant, because they differ in the time of their bearing. Again, the creatures which we would thus couple, must be one as lustful as the other: for a chaste creature, that useth coition but once a year, if he have not his female at that time, he loath his appetite before he can fancy any other mate: but those which are full of lust, will eagerly couple with another kind as well as their own. Among four-footed beasts, a dog, a goat, a swine, an ass, be most lascivious; among birds, partridges, quails, doves, sparrows. Moreover, they must be coupled at such a time as is fit for generation: for Nature hath prescribed certain times and ages fit for that work. The common time, is the Spring; for then almost all Creatures are prone to lust. The ages of them must likewise be fit: for the generative power comes to creatures at a set age. Neither of them must be barren, nor weak, nor too young; for then their seed is unfit for generation: but both of them, if it may be, in the prime of their best age and strength. If any creatures want appetite thereunto, there be many flights, whereby we may

Make them eager in lust.

And if the female do cast out the seed, there be means to make her hold it. Provocations to lust there are many set down by Writers, and some usual with us. *Alexander* writes, that keepers of sheep, and goats, and Mares, do besmear their hands with salt and nitre, and then rub the generative parts of them in the time of their coition, for their more lustful and eager performance of that action. Others besmear them with pepper, others with nuttles seed, others with myrrh and nitre; all of them kindle the appetite of the female, being well rubbed therewith, and make her stand to her male. The He-goats, if you besmear their chin, and their nostrils with sweet ointment, are thereby much inclined to lust; and contrariwise, if you tie a thred about the middle of their tail, they are nothing so eager of copulation. *Abstrus* sheweth, that if you wipe off some nature or seed of a mare, and therewith besmear the nostrils of a Stallion horse, it will make him very lustful. *Dydimus* saith, that if Rams, or any other beasts feed, upon the herb Milk-wort, they will become both eager to lust, and stronger for the act of copulation. *Pliny* sheweth, that Onions encrease desire of copulation in beasts, as the herb Rotcher doth in men. The Sheeps, holds the seed within her the better, if presently after copulation she be well beaten, and her genitories besprinkled with cold water, to make her run after it. Many such helps are recorded by those who have written the histories of living creatures.

CHAP. VI.

How there may be Dogs of great courage, and divers rare properties, generated of divers kinds of Beasts.

WE will first speak of Dogs, as being a most familiar creature with us, and suiting with many beasts, in bignesse, in like time of breeding; and besides, being always ready for copulation, and very lecherous, oft-times coupling with beasts of a far divers kind, and so changeth his shape and fashion, leaveth the bad qualities of his own kind, and is made fitter to hunt, to keep any thing from spoil, to play or make sport, and for divers other uses. And first, how

A strong Indian-dog may be generated of a Tygre.

This is called by some, a Mastiff; by others a Warrior, or a Hircan-Dog. *Aristotle* calls them Indian-dogs, and saith, they are generated of a Dog and a Tygre; and elsewhere, of a dog and another wilde beast, but he names it not. *Pliny* writes, that the Indians intending to generate dogs of Tygres, tie the She-tygres in the woods about rutting time; and dogs coupling with them engender young: but the first and second births they care not for, as being too fierce; but the third they bring up, as being milder and fitter for their uses. *Alexander* relates the story of this kind of Dogs, out of Indian Writers: that the stoutest Bitches, and such as are swiftest to run, and best to hunt, are by the shepherds tied to certain Trees within the Tygres walk: as soon as the Tygres light upon them, if they have not before met with their prey, they devour them; but if they be full of meat, and hot in lust, then they couple with the Bitches; and so generate, not a Tygre, but a dog, their seed degenerating into the mothers kind. And these dogs thus gendred, (scorn to hunt a Boar, or an Hart; but a Lion they will set gallantly upon. A Noble man of India made trial of the valor of these dogs, before *Alexander* the Great, on this manner: first, he set an Hart before him; but the Dog (scorning the Hart, flung not at him; next, a Boar, but neither stirred he at the Boar; after that a Bear; but he scorned the Bear too: last of all, a Lion; then the Dog seeing that he had an even match in hand, rose up very furiously, and run upon the Lion, and took him by the throat, and stifled him. Then the Indian that shewed this sport, and knew well this Dogs valour, first cut off his tail; but the Dog cared not for his tail, in comparison of the Lion which he had in his mouth: next, he cut off one of his legs; but the Dog held fast his hold still, as if it had been none of his legs: after that, he caused another of his legs to be broken; but the Dog still kept his hold: after that, his third leg, and yet still he kept his hold: after that, his fourth leg, and yet the Dog was still as fierce upon the Lion, as at the first: Nay, when last of all his head was cut off from his body, yet still it stuck fast by the teeth in the same place, where he took his first hold. *Alexander* seeing this, was much grieved for the Dogs death, and greatly amazed at his valour, that he would rather suffer his life, then his courage to be taken from him. The Indian perceiving that, gave to *Alexander* four such Dogs; and he received them as a great Present, and accepted them gladly and thankfully: and moreover, rewarded the Indian that gave them, with a Princely recompence. This same story *Philes* also writes. But *Diodorus Siculus* and *Sirabo*, say that *Sopitkes* a King, gave *Alexander* an hundred and fifty of these Dogs, all very huge and strong, and usually coupling with Tygres. And *Pollux* writes the same. And *Plutarch* describes the Indian-dog, and his fight before *Alexander*, as it is before related: *Pliny* writes, that the King of Albania gave *Alexander* a great Dog, where with he was much delighted: but when he brought the Dog, first Bears, then Ears, and then Deer, and saw he would not touch them, being much offended that so great a body should have so little courage, he caused him to be killed. The King that gave him, hearing this, sent him another, and withal charged the Messenger, that he should not be tried in small matches, but either with a Lion or an Elephant. So then, *Alexander* caused a Lion to be set before him, and presently the Dog killed him: afterward he tried him with an Elephant; and the Dog bristled and barked at him, and assaulted him so artificially every way, till the Elephant was giddy with turning about, and so fell down and was killed. *Gratius* writes of this kind of dogs, thus generated of a Bitch and a Tygre. There is also another kind of Dogs

Generated of a Lion.

And these are strong Dogs, and good Hunters. *Pollux* saith, that Arcadian Dogs first came of a Dog and a Lion, and are called Lion-dogs. And *Calim* writes the same: and *Oppianus* commends the Arcadian Dogs, and those of Tegea, which is a Town of Acadia. This is also

A strong and swift Dog, gendred of a kind of Wolf called Thos,

which, as *Aristotle* writes, is in all his entrails like a Wolf; and is a strong beast, swift, and is wont to encounter the Lion. *Pliny* saith, it is a kind of Wolf; *Hesychius* saith, it is like a Wolf; *Herodotus*, that it is gendred in Africa: *Solimus* calls them Ethiopian Wolves: *Nearchus* calls these beasts Tygres. and saith there be divers kinds of them. Wherefore *Gravins* saith, that dogs generated of these Thoes, are strong, and fit to hunt; and calls them half-lavage, as coming of a tame Dog, and a savage kind of Wolf. There is also a

Dog called Crocuta, gendred of a Dog and a Wolf.

Pliny saith, that these Dogs break all things with their teeth, and presently devour them. As the Indians join Tygres, so do the Gauls join Wolves and Dogs together; every herd of Wolves there, hath a Dog for their Ring-leader. In the Country of Cyrene in Libya, Wolves do couple with Dogs, as *Aristotle* and *Pollux* write, *Galen* in his book concerning the use of Parts, writes, that a Bitch may conceive by a He-wolf, and so the She-wolf by a Dog, and retain each others seed, and ripen it to the bringing forth of both kinds. *Diodore* saith, that the dog which the Ethiopians call Crocuta, is a compound of the Nature of a Dog and a Wolf. When *Niphon* was hunting, one of his dogs eagerly pursued a she-wolf, and overtaking her, began to line her, changing his fierceness into lust. *Alberius* saith, that the great Dog called a Mastive, is gendred of a Dog and a Wolf. I my self saw at Rome, a dog generated of a wolf; and at Naples, a she-wolf of a dog. *Ovid* saith, that the dog Nape was conceived of a Wolf; and *Ovid* and *Virgil* both, mention the dog Lycia, which, as *Isidore* writes, are generated of wolves and dogs coupling together. *Calim* calls these dogs Chaonides; being gendred of a kind of wolf called Chaos, as some suppose, whence they have that name. But if we would generate swift dogs, as Grey-hounds, we must join dogs with some swift beasts. As, couple dogs and foxes together, and they will

Gender swift Dogs, called Lacedaemonian Dogs.

Aristotle, and out of him *Galen*, report, that beasts may couple together, though they be of a divers kind; so that their nature do not much differ, and they be of a like bignesse, and thereby futable for their times of breeding and bringing forth, as it is betwixt dogs and wolves; of both which, are gendred swift dogs, called Lacedaemonian dogs: the first births are of both kinds; but in time, after sundry interchangeable generations, they take after the dam, and follow the kind of the female. *Pollux* saith, These are called Alopecidæ, fox-dogs; as *Xenophon* also writes of them, and makes them to be hunting dogs: and surely the best and swiftest hunting dogs, as Grey-hounds, are long-headed, and sharp-incured, as foxes are. *Hesychius* and *Varinus* call them Dog-foxes. But now, if we would generate a kind of

Swift Dogs, and strong wiskal,

we must make a medley of sundry kinds of dogs together; as a Mastive and a Grey-hound gender a swift, and wiskal a strong dog, as *Aristotle* writes: or else couple a dog with a wolf, or with a Lion; for both these mixtions have Hunts-men devised; the former

former, to amend certain natural defects in one kind; and the latter, to make their dogs stronger for the game, and craftier to eipie and take advantages; as commonly, together with the properties of the body, the qualities of the mind are derived into the young ones. *Ovid* mentions such mungrels amongst *Atheans* dogs: and *Oppianus* in his book of Hunting, counsels to join in the Spring-time, divers dogs together, if we desire to have any excellent parts in any; as the dogs of Elis, with them of Arcadia; the dogs of Crete, with them of Pannonia; Thracians, with them of Caria; Lacedaemonians, with them of Tuscica; and Sarmatian dogs, with Spanish dogs. Thus we see, how to generate a dog as stomachful as a Lion, as fierce as a Tygre, as crafty as a fox, as spotted as a Leopard, and as ravenous as a Wolf.

CHAP. VII.

How to generate pretty little dogs to play with.

Because a dog is such a familiar creature with man, therefore we will shew how to generate and bring up a little dog, and one that will be play-full. First of the generation

Of little Dogs.

In times past, women were wont to esteem little dogs in great price, especially such as came from Malta the Island situate in the Adriatick Sea, near to Ragusius. *Callimachus* terms them Melitian dogs. And *Aristotle* in his Problems, shews the manner of their generation; where he questioneth, Why amongst living creatures of the same kind, some have greater, and some have smaller bodies; and gives thereof a double reason: one, is the straightness of the place wherein they are kept; the other, is the scarceness of their nourishment: and some have attempted to lessen the bodies of them, even after their birth; as they which nourish up little whelps in small cages: for thereby they shorten and lessen their bodies; but their parts are prettily well knit together, as appears in Melitian dogs: for nature performs her work, notwithstanding the place. *Athenaus* writes, that the Sybarites were much delighted with Melitian dogs, which are such in the kind of dogs, as Dwarves are among men. They are much made of, and daintily kept, rather for pleasure then for any use. Those that are chosen for such a purpose, are of the smallest pitch, no bigger at their best growth then a mouse, in body well set, having a little head, a small snout, the nose turning upward, bended so for the purpose when they were young; long ears, short legs, narrow feet, tail somewhat long, a shagged neck, with long hair to the shoulders, the other parts being as it were shorn, in colour white; and some of them are shagged all over. These being shut up in a cage, you must feed very sparingly, that they never have their fill; and let them couple with the least you can find, that so lesse may be generated; for so *Hippocrates* writes, that Northern people, by handling the heads of dogs while they be young, make them lesse then, and so they remain even after they are come to their full growth: and in this shape they gender others, so that they make, as it were, another kind. But if you would know the generation of a

Dog that will do tricks and feats,

one that will make sport of himself, and leap up and down, and bark softly, and gnaw without biting, and stand upon his hindermost legs, holding forth his other legs like hands, and will fetch and carry; you must first let them converse and company with an Ape, of whom they will learn many sportful tricks; then let them line the Ape; and the young one which is born of them two, will be exceeding practised to do feats, such as Juglers and Players are wont to shew by their dogs. *Alberius* saith, that these kind of dogs may very well be generated of a dog and a fox.

CHAP. VIII.

How to amend the defects and lacks that are in dogs, by other means.

WE may also supply the lacks that are in dogs, by other means, and reach them new qualities, even by their food and nourishment: for we have shewed oftentimes, that qualities are drawn in together with the milk and nourishment whereby we live. *Columella* shews how

to make Dogs strong and swift:

If you would have them full of stout spirits, you must suffer them to suck the breasts of some other beasts; for alwayes the milk, and the spirits of the nurse, are much available, both for the quality of the body, and the qualities of the soul. *Oppianus* bids us to keep hunting dogs from sucking any ordinary Bitches, or Goats, or Sheep; for this, saith he, will make them too lazy and weak; but they must suck a rame Lionesse, or Hart, or Doe, or Wolf; for so they will become swift and strong, like to their nurses that give them suck. And *Alianus* gives the very same precept, in the very same words: for, saith he, when they shall remember that they had such strong and swift nurses, nature will make them ashamed not to resemble their qualities. *Pollux* saith, that for a while, the Dams milk is fittest meat for whelps; but after, let them lap the blood of those beasts which dogs have caught, that by little and little they may be acquainted with the sweetness of hunting. *Ctesias* in his book of Indian matters, writes, that the people called Cynamolgi, do nourish and feed many dogs with Bulls blood, which afterward being let loose at the Bulls of India, overcome them and kill them, though they be never so fierce: and the people themselves milk their Bitches, and drink it, as we drink Goats or Sheeps milk, as *Alianus* reports: and *Solinus* writes, that this is supposed to make that people flap-mouthed, and to grin like dogs. We may also make

an As become contrarious,

if we take him as soon as he is brought forth into the world, and put him to a Mare in the dark, that she may not discern him; for her own Colt being privily taken from her, she will give suck to the Ass as to her own foale: and when the hath done thus for the space of ten daies, she will give him suck alwayes after willingly; though she know him to be none of hers. Thus shall he be larger, and better every way.

CHAP. IX.

How to bring forth divers kinds of Mules.

WE will speak of the commixion of Asses, Horses, and such like: though it be a known matter, yet it may be we shall adde something which may delight the Reader. *Alianus* writes out of *Democritus*, that Mules are not Natures work, but a kind of theft and adultery devised by man: first committed by an Ass of Media, that by force covered a Mare, and by chance got her with foal; which violence men learned of him, and after that made a custom of it. *Homer's* Scholiast saith, that Mules were first devised by the Venetians, a City of Paphlagonia. It is written in *Genesis*, chap. 36. v. 24. that *Anah, Esau's* kinsman, feeding his fathers Asses in the wilderness, found out Mules. Now

A Mule cometh of a Mare and an Ass:

They have no root in their own kind, but are grafted as it were, and double-kindred,

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ded, as *Varro* saith. If you would have a strong and a big Mule, you must chuse a Mare of the largest assize, and well-knit joints, not regarding her swiftnesse, but her strength. But there is another kind of mule called *Hinnus*, that cometh

of a Horse and a She-ass.

But here special choice must be made of the Ass, that she be of the largest assize, strongly jointed, and able to endure any labour, and of good qualities also; for howsoever it is the Sire that gives the name to the young one, and it is called *Hinnus*, of the Horse; yet it grows altogether like the Dam, having the main and the tail of an Ass, but Horses ears; and it is not so great of body as the Mule is, but much slower, and much wilder. But the best She-mules of all, are generated

of a wilde Ass, and of a She-ass,

and these are the swiftest too; for though the Mule that is begotten by the He-ass, be both in shape and qualities very excellent in his kind, yet that which is begotten of the wilde Ass, cometh nothing behind the other, but only that it is unruly and stubborn, and somewhat scammel, like the Sire. These Mules thus gendred of a wilde Ass, and a She-ass, if they be males, and put to cover a Mare, beget excellent young ones, which by little and little wax tame, resembling the shape and mildnesse of their Sire, but the stomach and swiftnesse of their Grand-sire; and they have exceeding hard feet, as *Columella* writes. These happily are the Mules which *Aristotle* writes, are only in Syria, swift, and fertile, called by the common name of Mules, because of their shape, though their kind be of a wild Ass. But there is a more common kind of

Strong Mules gendred of a Bull and an Ass,

which is a fourth sort of Mules, found in Gratiopolis, and called by a french name. *Jumar. Gesner* reports, that at the foot of the Hill *Spelungus* in Rhetia, was seen a Horse gendred of a Mare and a Bull. And I my self saw at Ferrara, certain beasts in the shape of a Mule, but they had a Bulls head, and two great knobs in stead of horns; they had also a Bulls eyes, and were exceeding stomachful, and their colour was black: a spectacle, wherewith we were much delighted. I have heard, that in France, they be common; but I could see none there, though I passed through the whole Country.

CHAP. X.

How to mingle the Sheep and Goats together, by generation.

IF we would better any qualities in a Ram, we must effect it by coupling them with wild beasts, such as are not much unlike, either in quantity or in kind. There is a beast called

Musinus, gendred of a Goat and a Ram.

Pliny saith, that in Spain, but especially in Corfica, there are beasts called *Musimones* not much unlike to Sheep, which have Goats hair, but in other parts, Sheep: the young ones which are gendred of them, coupling with Sheep, are called by the young ones which are gendred of a Goat and a Ram. I have heard that in Rhetia, in the Helvetian confines, there are generated certain beasts, which are Goats in the hinder parts, but in the former parts, Sheep or Rams; but they cannot live long, but commonly they die, as soon as they are born: and that there the Rams being grown in years, are very strong and lustful, and so oftentimes meeting with goats, do

do run over them: and that the young ones which wilde Rams beget of tame Sheep, are in colour like the Sire, and so is their breed after them; and the wool of the first breed is shaggy, but in their after-breed soft and tender. On the other side, there is a beast called

Cinirus, generated of a He-goat, and an Ewe,

as the same *Albertus* writeth. But the best devised adultery is, to couple in generation, and thereby to procreate young ones, of

A wilde and a tame Goat.

Writers affirm, that whatsoever kind hath some wilde, and some tame, the wildness of them, if they couple with the tame of the same kind, is altered in the succeeding generations; for they become tame. *Columella* writes, that many wilde Rams were brought out of Africa into Cales, by some that fit our games before the people; and *Columella*, the Uncle of this Writer, bought some of them, and put them into his grounds; and when they were somewhat tame, he let them cover his Ewes: and these brought lambs that were rough, and had the colour of their Sire: but these then afterward coupling with the Ewes of Tarentum, begot lambs that had a thinner and a softer fleece. And afterward, all their succeeding generations resembled the colour of their Sires, and Grand-sires, but the gentleness and softness of their Dams. The like is experienced in Swine: for we may bring forth

Of a wild and a tame Swine, the beast called Hybrides:

for a Boar is exceeding hot in lust, and wonderfully desires coition; inso much, that if the female refuse to couple with him, either he will force her, or kill her. And surely howsoever, some wilde beasts being made tame, are thereby unfit for generation, as a Goose, a Hart brought up by hand from his birth; and a Boar is hardly fruitful in such a case: yet there is no kind so apt for generation, the one being wilde, and the other tame, as the kind of Swine is. And those which are thus gendered, these half-wilds, are called Hybrides, happily because they are generated in reproachful adultery: for *Hybris* signifies reproach.

CHAP. XI.

Of some other commixtions, whereby other beasts of divers kinds are generated.

WE will speak yet farther of the commixtion of divers beasts differing in kinde; as also of other mixtions derived from these, so to find out all such kinds: and moreover we will shew, that of their young, some take after the Sire most, and some after the Dam. And first, that

A Leopard is gendered of a Libard and a Lioness.

The Lioness is reported to burn in lust; and because the Lion is not so fit for copulation, by reason of his superfluity of heat, therefore she entertains the Libard into the Lions bed: but when her time of bringing forth draws near, she gets away into the Mountains, and such places where the Libards haunt: for they bring forth spotted whelps, and therefore nurse them in thick woods very covertly, making shew to the Lions, that they go abroad only to seek some prey; for if the Lions at any time light upon the whelps, they tear them in pieces, as being a bastard brood, as *Philopetrus* writes. In the wilde of Hircania, there are Leopards, as it were, another kind of Panthers, which are known well enough, which couple with the Lioness, and beget Lions; but they are but base Lions, as *Solinus* writes. *Iisdore* saith, that

that the Libard and the Lioness coupling together, procreate a Leopard, and so make a third kind. *Pliny* saith, That those Lions which are generated of Libards, do want the manes of Lions. And *Solinus* saith, that the Lion can find out by his smell, when the Lioness hath played the Harlot; and seeks to revenge it upon her with all his might: and therefore the Lioness washes her self in some River, or else keeps aloof from him, till the scent be wasted. Now as there are two sorts of Mules, one of a Horse and an Ass, the other of an Ass and a Mare; so there are two sorts of Leopards, one of a Libard and a Lioness, the other of a Lion and a Panther, or She-libard: that is in body like a Lion, but not in courage; this is in body and colour like a Libard, but not in stomach: for all double-kind creatures, take most after their mother, especially for shape and quantity of their bodies. *Claudius* saith, that there is a kinde of Libard, which he calls a Water-libard, that is generated of a mingled seed, when a strong and vigorous Libard meeteth with a Lioness, and happily coupleth with her: and this kinde of Libard is like the Sire for his spots, but his back and the portraiture of his body is like his Dam. Now there is another copulation of the Lioness, when the

Hyana and the Lioness gender the beast Crocuta;

for the Lioness is very furious in lust, (as we shewed before) and couples with divers kinds of beasts: For *Pliny* writes, and *Solinus* writes the same, That the Hyana and the Lioness of Ethiopia, gender the beast Crocuta. Likewise the Panther is a most lustful beast, and she also couples with beasts of divers kinds; with a Wolf especially: of both which, the

Hycopanther, or beast called Thoes, is gendered;

for the Panther, when her facoring is come, goeth up and down, and makes a great noise, and thereby assembles many, both of her own kind, and of other kinds also. And amongst the rest, the Wolf oft-times meets and couples with her, and from them is generated the beast Thoes, which resembles the Dam in the spots of his skin, but in his looks he resembles the Sire. *Oppianus* saith, That the Panther and the Wolfe do gender this Thoes, and yet he is of neither kinde: for, saith he, oft-times the Wolfe cometh to the Panthers Den, and couples with her; and thence is generated the Thoes: whose skin is very hard, and is meddled with both their shapes; skinned like a Panther, and headed like a Wolfe. There is also a

Thoes gendered of a Wolf and a female Hyana.

This medley, *Hesychius* and *Varinus* have described; That of them comes this Thoes, as the Greeks call it. The Scholiast upon *Homer* saith, That it is like to the Hyana: and some call it Chaos. *Pliny* saith, That this Chaos, which by the French is called Raphium, was first set forth for a shew, in the games of *Pompey* the Great: and that it hath spots like a Leopard, but is fashioned like a Wolf. But the Greeks make mention of a very strange adultery, that

The Bactrian Camel is gendered of a Camel and a Swine;

for *Didymus*, in his workes called Geoponica, reporteth, that in certain Mountaines of India, Boares and Camels feed together, and so fall to copulation, and gender a Camel: and this Camel so gendered, hath a double rising, or two bunches upon his back. For as the Mule which is generated of a Horse and an Ass, is in many qualities like the Sire, so the Camel which

is begotten of a Boar, is strong and full of stiffe bristles like a Boar; and is not so soon down in the mud as other Camels are, but helps himself out unjustly by his own force; and will carry twice so great a burthen as others. But the reason of their name, why they are called Bactrian Camels, is this; Because the first that ever was so generated, was bred in the Country of Bactria.

CHAP. XII.

Of sundry copulations, whereby a man genders with sundry kinds of Beasts.

I Am much ashamed to speak of it, that Man being the chief of all living Creatures, should so foully disparage himself, as to couple with brut beasts, and procreate so many half-savage Monsters as are often seen: wherein Man shews himself to be worle then a beast. I will relate some few examples hereof, thereby to make such wicked wretches an obloquie to the World, and their names odious to others. *Plutark* saith, That brut beasts fall not in love with any, but of their own kinde; but man is so incensed with lust, that he is not ashamed most villanously to couple himself with Mares and Goats, and other Beasts; for Man is of all other Creatures most lecherous, at all seasons fit and ready for copulation; and besides, agrees with many living Creatures in his time of breeding: all which circumstances make much for the producing of monstrous, and half-savage broods. And howsoever the matter we speak of is abominable, yet it is not fruitlesse, but helps much to the knowledge of some other things in the searching out of the secrecies of nature. *Plutark* in his Tract, which he calls the Banquet of the wise men, sheweth, that a shepherd brought into the house of *Periander*,

A Babe gendered of a Man and a Mare,

which had the hands, and neck, and head of a Man, but otherwise it was like a Horse; and it cried like a young child. *Thales*, as soon as he saw it, told *Periander*, that he did not esteem it as a strange and monstrous thing, which the gods had sent to portend and betoken the seditions and commotions likely to ensue, as *Diocles* thought of it; but rather as a naturall thing: and therefore his advice was, that either they should have no Horse-keepers; or if they had, they should have wives of their own. The same Author in his Parallels, reporteth out of *Agefilan* his third book of Italian matters, that *Fulvius Stella* loathing the company of a woman, coupled himself with a Mare, of whom he begat a very beautiful maiden-child; and she was called by a fit name, *Epona*. And the same *Plutark* reporteth also of

A maiden that was generated of a Man and an Ass;

for *Arifonimus Ephesius*, the Son of *Demonstratus*, could not away with a womans company, but made choice of an Ass to lie with; and she brought him forth after a certain time, a very comely maiden, and in shew exceeding beautiful: she was called *Onoscelus*, that is to say, one having Asses thighs: and this story he gathered out of *Aristotle*, in the second of his Paradoxes. But *Galen* cannot think this possible; nay, it is scarce possible in nature, seeing a Man and an Ass differ so much as they do: for if a man should have to do with an Ass, her wombe cannot receive his seed, because his genitories are not long enough to convey it into her place of conception: or if it were, yet she would presently, or at least not long after,

after, murre his seed. Or, if she could so conceive, and bring her birth to perfection, how, or by what food should it be nourished after the birth? But, though this can hardly be, yet I do not think it altogether impossible, seeing all men are not of a like complexion, but some may be found, whose complexion doth not much differ from a horses; and some men also have longer and larger genitories then others; as also some Mares and Asses have lesse and shorter genitories then others have: and it may be too, that some celestial influence hath a stroke in it, by enlivening the seed, and causing the Dam to conceive it, and bring it forth in due time. And because all these things do very seldom concur together, therefore such births are very seldom seen. *Alianus* writeth another story, That there was once generated

A half-beast of a Man and a Goat.

There was a certain young man in Sybaris, who was called *Crachis*, a lustier after Goats; and being over-ruled by his lust, coupled himself with a fair Goat, the fairest he could light upon, and lived with her as his Love and Concubine, bestowing many gifts upon her, as Ivy and Rushes to eat; and kept her mouth very sweet, that he might kisse her; and laid under her soft grass, that she might lie easie, and sleep the better. The He-goat, the Ring-leader of the Herd, espying this, watcht his time when the young man was on sleep, and fell upon him and ipoiled him. But the She-goat, when her time was come, brought forth an infant that had the face of a man, but the thighs of a Goat. The same Author writes, That

Women lie with He-goats, and with the Cynocephali;

for the He-goats are so lecherous, that in the madnesse of their lust, they will set upon Virgins, and by force ravish them. *Herodorus* in his second book, writeth of a He-goat, that had to do with a woman openly, and in the sight of many men standing by. *Strabo* saith, that in the Mediterranean Sea, a little without the mouth of a River neer to Sebenis and Pharnix, there is an Island called Xoas, and a City within the Province of Sebenis, and the Cities Hermopolis and Mendes, where Pan is honoured for a God, and with him is likewise honoured a He-goat; and there, as *Pindarus* reports, He-goats have to do with women: In the utmost corner of the winding of the River Nilus, saith he, are fed certain Herds of Goats; and there the lecherous He-goats are mingled with women. *Alianus* also writes of the Indians, that they will not admit into their Cities any red Apes, because they are oft-times mad in lust towards women; and if at any time they find such Apes, they hunt and destroy them, as being adulterous beasts. *Pliny* writes also, That

Man couples with divers kinds of beasts:

for some of the Indians have usual company with brut beasts; and that which is so generated, is half a beast, and half a man.

CHAP. XIII.

That divers kinds of birds may be generated of divers birds coupling together.

BEfore we come to speak of the commixion of birds, it is meet to pre-
scribe certain observations for the more easie effecting thereof; that if
we have need to supply any defects in any birds, we may be the better
instructed

instructed how to perform it readily, to make them fitter for our uses. We shewed before out of *Aristotle*, that if we would mingle Creatures of divers kinds, we must see that they be of like bignesse, of a like proportion of time for their breeding, of a like colour; but especially, that they be very lecherous; for otherwise they will hardly insert themselves into a strange stock. If a Falconer be desirous to produce fighting Hawks, or Cocks, or other birds, he must first seek out good lusty males, such as be strong and stomachful, that they may derive the same qualities into their young ones. Next, they must procure strong and courageous females: for if but one of them be stomachful, the young ones will rather take after the dullness and faint-heart of the one, then after the quickness and courage of the other. When you have thus made choice of the best breeders, before their copulation, you must keep them together within doors, and bring them by little and little acquainted with each other; which you may best do, by causing them to feed and to live together. Therefore you must prepare a pretty little cottage, about ten foot long, and ten foot broad; and let all the windows be made out toward the South, so that there may good store of light come in at the top of the house. In the middle you must make a partition with lattices or grates, made of Others: and let the rods stand so far asunder, as that the birds head and neck may go in between them: and in one side of the room, let that bird be alone by her self, which you would make tame; in the other side, put the other birds which you purpose to join in copulation with the strange bird. So then, in the prime of the Spring, (for that is the time wherein all Creatures are most eager in lust) you must get you fruitful birds, and let them be of the same colour, as is the bird which you desire to become tame. These you must keep certain daies at the same board as it were, and give them their meat together, so that the strange bird may come at it through the grate: for by this means she will learn to be acquainted with them, as with her fellows, and will live quietly by them, being as it were kept in prison from doing them any wrong: whereas otherwise she would be so fierce upon them, that she would spare none, but if she could, destroy them all. But when once by tract of time, and continual acquaintance with his fellows, this male-bird is become somewhat gentle, look which of the females he is most familiar with, let her be put in the same room where he is; and give them both meat enough. And because commonly he either kills, or doth not care for the first female that is put unto him, therefore, lest the keeper should lose all his hope, he must keep divers females for supply. When you perceive that he hath gotten the female with young, presently you must divorce one of them from the other, and let him in a new mare, that he may fill her also: and you must feed her well till she begin to sit upon her eggs, or put the eggs under some other that sits. And thus shall you have a young one, in all respects like the Cock: but as soon as the young ones are out of the shell, let them be brought up by themselves, not of their mother, but of some other Hen-bird. Last of all, the females of this brood, when they be come to ripeness, that they stand to their Cock, their first or their second brood will be a very exact and absolute kinde.

CHAP. XIV.

Divers commixtions of Hens with other Birds.

WE will begin with Hens, because they are in great request with us, and are household-birds, alwayes before our eyes; and besides, they may be very profitable and gainful, if we can tell how to procreate and bring up divers kinds of them. Cocks are of all other most lecherous; and they spend their feed, not only at the sight of their Hens, but even when they hear them crike or cackle; and to represent their lust, they are oftentimes carved. They tread and fall to their sport, almost all the year long. Some Hens are very lusty, and withal very fruitful; insomuch that they lay three-score eggs before they sit to hatch them: yea, some that are kept in a pen, do lay twice in one day; and some bring forth such store

of eggs, that they consume themselves thereby, and die upon it. We will first shew

How to couple a Partridge with a Hen.

Partridges are much given to lust, and very eager of coition, and are mingled with other birds of divers kinds, and they couple betwixt themselves, and so have young ones; as first with Hens, of whom they procreate certain birds, which partake of both kinds in common, for the first brood; but in proceesse of time, when divers generations have successively passed, they take meerly after the mother in all respects, as *Aristotle* writeth. The field-cocks are usually more lustful then household-cocks are, and they tread their Hens as soon as ever they are off the roost; but the Hens are more inclinable to coition, about the middle of the day, as *Athenaeus* writes, out of *Ælianus* and *Theophrastus*: of which circumstances we may take our best advantage in coupling them with Partridges. After the same manner

A Hen and a Pheasant may gender together;

for, as *Florentinus* writes, the Pheasant and the Hen agree both in their time of laying, either of them bringing forth eggs one and twenty daies after conception. And though she be not so wanton as other birds are, yet in their treading time they are glad of coition, and not very wilde, especially those that are of the smaller sort: for these may easily be made tame, and suffered to go amongst Hens; but at their first taking they are very fierce, insomuch that they will not only kill Hens, but even Peacocks too. Some men bring up Pheasants to make a game of them: but some breed them for delight and pleasure, as I saw at Ferrara in the Princes Court, where was brought up very great store, both of Hens and Pheasants too. And this hath been an old practice: for in *Athenaeus* we find a saying of *Ptolemy*, that not only Pheasants were sent for out of Media, but the Country Hens, they also afforded good store of them, the eggs being conceived in them by the treading of a Cock-pheasant. First then, you must take a Cock-pheasant, and be very careful in keeping of him tame amongst your Hens: after that, you must seek out Country-hens of divers colours, as like the colour of the Hen-Pheasant as you can, and let them live with the Cock-Pheasant, that in the Spring-time he may tread the Hens; and they will bring forth speckled eggs, everywhere full of black spots, far greater and goodlier then other eggs are. When these are hatched, you must bring up the chicken with barley-flour, and some leaves of smallage shred in amongst it; for this is the most delightful and nourishing food that they that they can have. There is also

A Chick gendered of a Pigeon and a Hen:

the Pigeon must be young, for then he hath more heat and desire of copulation, and much abundance of seed; for if he be old, he cannot tread: but young Pigeons do couple at all times, and they bring forth both Summer and Winter. I had my self at home a single Pigeon, & a Hen that had lost her Cock: the Pigeon was of a large size, and wanton withal; the Hen was but a very small one: these lived together, and in the Spring-time the Pigeon trode the Hen, whereby the conceived, and in her due season laid eggs, and afterward hatched them, and brought forth chicken that were mixt of either kind, and resembled the shape of them both. In greatness of body, in fashion of head and bill, they were like a Pigeon; their feathers very white and curled, their feet like a Hens feet, but they were overgrown with feathers; and they made a noise like a Pigeon: and I took great pleasure in them; the rather, because they were so familiar, that they would sit upon the bed, or tangle into some womans bosom. But there is yet another mixture, when

A Cock, and a Pea, gender the Gallo-Pavus;

which is otherwise called the Indian-hen, being mixt of a Cock and a Pea, though the shape be liker to a Pea than to a Cock. In body and gearneffe it resembles the Pea, but it hath a combe and chackels under the chin like a Cock: it hath the voice of a Pea, and spreads forth her tail, and hath such varietie of colours as she hath. The taste of her flesh reliſhes like a compound of them both; whereby it appears, that both kinds are not unſuitably matcht together. But afterward, when the ſhe Gallo-pavus and the Pea-cock were brought up tame together, we had of them very fruitful egges, which being hatcht, yeelded very goodly chickens, whoſe feathers were of a moſt orient and glistering colour: and theſe young ones afterward growing bigger, were mingled in copulation with Pea-cocks and Pea-hens, and the brood which was ſo generated of them, were in a manner all of the kind and faſhion of the Pea. The like a man may conjecture of other kinds of birds.

CHAP. XV.

How to generate Hawkes of divers properties.

WE will ſhew ſome commixtions of Hawks, by the example whereof, you may imagine of your ſelf the like in other birds: and hereby it ſhall appear how we may amend divers faults and defects in Hawks, and engraſſe in them ſome new qualities to be derived from their ſundry progenitors. And firſt, how

The bird Theocronus is gendred of a Hawk and an Eagle.

Hawks are exceeding hot in luſt; and though there be divers kinds of them, yet they all couple together among themſelves without any difference, as *Aristotle* writeth: they couple with Eagles, and thereby engender baſtard Eagles. Eagles are moſt lecherous: and whereas among other creatures, the female is not alwayes ready and willing to yeeld to the male for coition; yet the Eagles never reſuſe it: for though they have been trod never ſo oft, yet ſtill, if the male deſire copulation, the female preſently yeelds unto him. *Albanus* accounts ordinary and common Hawks in the kind of Eagles. *Oppianus* in his *Ixentica* ſaith, that there is a bird known well enough, called Theocronus, which is generated of a male Hawk, and a female Eagle. There is a kind of Hawks ſo wholly given over to luſt, that in the Spring-time they loſe all their ſtrength, and every little bird ſnaps at them; but in the Summer, having recovered her ſtrength, ſhe is ſo luſty, that ſhe flies up and down to revenge her ſelf upon thoſe little birds; and as many of them as ſhe catches, ſhe devours. If the male of this kind do but hear the voice of the female Eagle, preſently he flies to her, and they couple together: but the egges which ſhe conceives by this baſe copulation, ſhe ſcorns to hatch and ſit upon: and that ſhe may not be known of it to the male Eagle, ſhe flies far away from him: for the male Eagle, if once he perceive that ſhe hath played the harlot, divorces her from him, and is thoroughly revenged upon her. Theſe birds are now commonly called Sea-eagles. There is alſo a commixtion, whereby the Hawk mingles himſelf

with a Faulcon, and with a Buzzard, and the Eagle Niſus;

for Hawks do not only couple with their own kind, but with Faulcons, Buzzards, and Eagles of divers kinds, as alſo with moſt of thoſe fowles that live upon the prey and ſpoil of other birds; and according to the diverſity of thoſe kinds, divers kinds of Hawks are generated. Beſides, they couple with ſtrange Faulcons of other Countries, and other kinds: for as ſoon as they be hatcht and Pen-feathered, if their parents ſee that they are not right Faulcons, preſently they beat them away; and ſo partly becauſe they cannot endure their parents rage, and partly to get

get their living, they flee away into ſtrange places; and there finding no mates of their own kind, they ſeek out a mate of another kind, the likeſt to her own kind that ſhe can mee: with, and couples with them. So then, if you have Hawks that deſcend from the right and beſt kind, are may more eaſily work upon them, then upon ſuch as come of the baſer ſort. In like manner there may be generated of divers kinds of Eagles divers fowles, as

The Oſprey, the ſowl called Offſtragu, and Ravens alſo.

Pliny diſcourſing of the Oſprey, ſaith, That they have no proper kinde of their own, but are deſcended from divers ſorts of Eagles mingled together: and that which cometh of the Oſprey, is of the kind of Offſtragi: and that which cometh of the Offſtragi, is a kind of little Ravens, and of theſe afterward is generated a kind of great Ravens, which have no iſſue at all: the Author of which aſſertions before *Pliny*, was *Aristotle* in his book of Wonders. *Oppianus* ſaith, that Land-eagles are a baſtard brood, which their parents beat out of their neſts, and ſo they are for a while nourished by ſome other fowles, till at length they forſake the Land, and ſeek their living in the Sea.

CHAP. XVI.

Of the commixtion of divers kinds of fiſhes.

IT is a very hard thing for a man to know, whether divers kinds of fiſhes be mingled together or no; becauſe they live altogether under the waters, ſo that we cannot obſerve their doings; eſpecially ſuch as they praſtice againſt the ordinary courſe of nature. But if we rightly conſider that which hath been ſpoken before, we may eaſily effect their commixtion, namely, if we take ſuch fiſhes as are much given to venery, and match thoſe together which are alike in ſignels; in time of breeding, and in other ſuch conditions as were before required. *Aristotle* in his book of living Creatures, ſaith, that divers fiſhes in kind never mingle their ſeeds together: neither did ever any man ſee two fiſhes of divers kinds couple in generation, excepting only theſe two,

The Skate and the Ray, which engender the Rhinobatos;

which is ſo called of both his parents names compounded together. And out of *Aristotle*, *Pliny* reporteth, that no fiſhes of divers kinds mingle their ſeeds, ſave only the Skate and the Ray; of both which is gendred the fiſh Rhinobatos, which is like the Ray in all his former parts, and hath his name in Greek answerable to his nature; for it is compounded of the names of both his parents. And of this kind of fiſh I never read nor heard any thing beſides this. *Theodorus Gaza* tranſlates the word Rhinobatos into *Squatina-raia* in Latine, that is, a Skate-ray: and though ſome deny that there is any ſuch fiſh, yet ſurely it is found in the Sea about Naples; and *Simon Portus*, a very learned Philoſopher of Naples, did help me to the ſight of one of them; and the picture thereof is yet reſerved, and it is to be ſeen.

CHAP. XVII.

How we may produce new and ſtrange Monſters.

STRANGE and wonderful monſters, and abortivements, or untimely births, may be ſengendred of living Creatures, as by thoſe wayes of which we ſpake before, namely, the commixtion of divers kinds; ſo alſo by other means, as by the mixture of divers ſeeds in one wombe, by imagination, or ſuch like cauſes. Concerning Imagination, we will ſpeak hereafter. Now at this time let us ſee the wayes of engendring ſuch monſters, which the Ancients have ſet down, that the ingenious Reader

der may learn by the consideration of these wayes, to invent of himself other wayes how to generate wonderful monsters. *Democritus*, as *Aristotle* saith, held that the mixture of many seeds, when one is received into the wombe before, and another not long after, so that they are meddled and confounded together, is the cause of the generation of many Monsters, that sometimes they have two heads, and more parts then the nature of their kinde requires. Hence it is that those birds which use often coitions, do oftentimes bring forth such births. But *Empedocles*, having forecast all scruples and doubts within himself, seems to have attained the truth in this case: for he saith, that the causes of the generation of monstrous Creatures, are these; either if the seed be too much, or if it be too little, or if it light not in the right place, or if it be scattered into many parts, or if the ingredients be not rightly affected to procreate according to the ordinary course of nature. And *Sirason* assigns many reasons, why such monsters are generated; as, because some seed is cast upon the former, or some of the former seed is diminished, or some parts transposed, or the wombe puffed up with winde. And some Physicians ascribe it principally to the place of conception, which is oft-times misplaced, by reason of inflammations. *Aristotle* saith, that such Creatures as are wont to bring forth many young ones at one burthen, especially such as have many cells or recepts for seed in their wombe, do most commonly produce monsters: for in that they bring forth some that are not so fully perfect, thereby they degenerate more easily into monsters: especially of all other, the Pigs that are not farrowed at their due time, but some certain dayes after the rest of the litter; for these cannot chule but be monsters in one part or other; because whatsoever is either more or less then that which the kind requires, is monstrous, and besides Nature. And in his book of Problems he saith, that small four-footed Creatures bring forth monsters: but Man, and the greater sorts of four-footed beasts, as Horses and Ases, do not produce them so often. His reason is, because the smaller kinds, as Bitches, Sows, Goats, and Ewes, are far more fruitful then the greater kinds are; for, of those, every one brings forth at least one, and some bring forth for the most part, many at once. Now Monsters are wont to be produced then, when there is a commixtion or confusion of many seeds together, either by reason of sundry copulations, or because of some indisposition in the place of conception. Hence it is, that birds also may bring forth monsters; for they lay egges sometimes that have a double yelk: and if there be no small skin that keeps both the yelks asunder, then the confusion of them causeth the breed to become monstrous. Nature is earnest in the fashioning of a living Creature; and first shapes out the principal parts of the body: afterwards she worketh sometimes more, sometimes lesse, as the matter can afford which she works upon, still framing herself thereunto: whereby it cometh to passe, that if the matter be defective, then she cannot have her forth; if it be overmuch, then is nature overcome, and so both wayes hindered of her purpose, and thereby brings forth monstrous broods, as in artificial births hath been often seen; some being defective, as having but one leg, or but one eye; some exceeding the ordinary course, as having four eyes, or four arms, or four feet, and sometimes having both sexes in them, which are called Hermaphrodites: and so, look how your art disposes and layes things together, and after the same manner, Nature must needs accomplish her work, and finish your beginnings. But whosoever wouldst bring forth any monsters by art, thou must learn by examples, and by such principles be directed, as here thou mayest find. First, thou must consider with thy self, what things are likely and possible to be brought to passe: for if you attempt likely matters, Nature will assist you, and make good your endeavours, and the work will much delight you: for you shall see such things effected, as you would not think of; whereby also you may find the means to procure more admirable effects. There be many reasons and wayes, whereby may be generated

Monsters in Man.

First, this may come by reason of inordinate or unkindly copulations, when the seed

seed is not conveyed into the due and right places: again, it may come by the narrowness of the wombe, when there are two young ones in it, and for want of room, are pressed and grow together: again, it may come by the marring of those thin skinnies of partition, which nature hath framed in a womans wombe, to distinguish and keep asunder the young ones. *Pliny* writes, that in the year of *Caius Lalius* and *Lucius Domitius* Consulship, there was born a maid-child that had two heads, four hands, and was of double nature in all respects: and a little before that, a woman-servant brought forth a child, that had four feet, and four hands, and four eyes, and as many ears, and double natured every way. *Philostratus* in the life of *Apolonius* writes, that there was born in Sicily, a boy having two heads. I my self saw at Naples, a boy alive, out of whose breast came forth another boy, having all his parts, but that his head only stuck behind in the other boys breast; and thus they had sticken together in their mothers wombe, and their navils also did cling each to other. I have also seen divers children having four hands and four feet, with six fingers upon one hand, and six toes upon one foot, and monstrous divers other wayes, which here were too long to rehearse. By the like causes may

Monsters be generated in Beasts.

We shewed before, that such beasts as bring forth many young ones at one burthen, especially such as have many cells or recepts in their wombe for seed, do oftentimes produce Monsters. *Nicocreon* the Tyrant of Cyprus, had a Hart with four horns. *Alianus* saw an Oxe that had five feet; one of them in his shoulder, so absolutely made, and so conveniently placed, as it was a great help to him in his going. *Livy* saith, that at *Sessa-Arunca* a City in Italy, there was eaned a Lambe that had two heads; and at *Apolis*, another Lambe having five feet; and there was a kidling with but three feet. *Rhaphes* reports, that he saw a Dog having three heads. And there be many other like matters which I have no pleasure to speak of. But it may seem that

Monsters in Birds may be more easily produced;

both in respect that they are more given to lust, and because also they bear in their bodies many egges at once, whereby they may stick together, and easily cleave each to other: and besides this, those birds that are by nature very fruitfull, are wont to lay egges that have two yelkes. For these causes *Columella* and *Leontinus* the Greek, give counsel to air and purge the houses where Hennes are, and their nests, yea and the very Hennes themselves, with Brimstone, and pitch, and torches; and many do lay a plate of iron, or some nailes heads, and some Bay-Tree boughs upon their nests; for all these are supposed to be very good preservatives against monstrous and prodigious births. And *Columella* reports farther, that many do strew grasse, and Bay-Tree boughs, and heads of Garlick, and iron nails, in the Hens nests; all which are supposed to be good remedies against thunder, that it may not marre their egges; and these also do spoil all the imperfect chickens, if there be any, before ever they grow to any ripeness. *Alianus* reporteth out of *Apian*, that in the time of *Oeneus* King of the South, there was seen a Crane that had two heads; and in another Kings daies, another bird was seen that had four heads. We will shew also how to hatch

A chicken with four wings and four feet,

which we learn out *Aristotels*. Amongst egges, some there are oft-times that have two yelkes, if the Hennes be fruitful: for two conceptions cling and

and grow together, as being very near each to other; the like whereof we may see in the fruits of Trees, many of them being twins, and growing into each other. Now, if the two yolks be distinguished by a small skinn, then they yield two perfect chickens without any blemish: but if the yolks be meddled one with another, without any skinn to part them, then that which is produced thereof, is a Monster. Seek out therefore some fruitful Hennes, and procure some of the perfectest eggs that they lay: you may know which are for your purpose, by the bignesse of them; if not, then hold them against the Sun, and you shall discern, both whether there be in them two yolks, and also whether they be distinguished or no: and if you finde in them such plenty of matter, that you see they are for your turn, let them be sitten upon, their due time, and the chickens will have four wings and four legges: but you must have a special care in bringing them up. And as some eggs have two yolks, so there are some that have three: but these are not so common; and if they could be gotten, they would yield chickens with six wings and six legges, which would be more wonderful. There hath been seen a small Duck with four feet, having a broad thin bill, her fore-parts black, her hinder-parts yellow, a black head, whitish eyes, black wings, and a black circle about her neck, and her back and tail black, yellow feet, and not standing far asunder; and she is at this day kept to be seen at Torga. No question but she was generated after the same manner as we spake even now of chickens. So they report of a Pigeon that was seen which had four feet. And many such monsters we have oft-times hatcht at home for pleasure sake. So also are Serpents generated, having many heads and many tails. *Aristotle* writes of certain Serpents, that they may be generated after the same manner, to have many heads. The Poets, and the ancient devisers of Fables, do speak much of that Hydra Lerna, which was one of *Hercules* labours to overcome: which Fiction was without all question occasioned by these kinds of Monsters. And whilst I was employed about the writing of this present work, there was in Naples a Viper seen alive, which had two heads, and three cloven tongues, and moved every one of them up and down. I myself have seen many Lizards that had two or three tails, which the common people most foolishly esteeme to be a jest; and it cannot be but these were generated of such eggs as had two yolks.

CHAP. XVIII.

Of certain other waies how to produce monstrous births.

WE may also produce Monsters by another way then that which we spake of before; for even after they are brought forth, we may fashion them into a monstrous shape, even as we list: for as we may shape young fruits as they grow, into the fashion of any vessel or case that we make for them to grow into; so we may make a Quince like a mans head, a Cucumber like a Snake, by making a case of that fashion for them to grow in; so also we may do by the births of living Creatures. *Hippocrates* in his book of Air, and Water, and Places, doth precisely set down the manner hereof; and sheweth how they do it, that dwell by the River Phasis, all of them being very long-headed, whereas no other Nation is so besides. And surely Custom was the first cause that they had such heads; but afterward Nature framed her self to that Custom; inasmuch that they esteemed it an honourable thing to have a very long head. The beginning of that Custom was thus. As soon as the child was new born, whilst his head was yet soft and tender, they would presently crush it in their hands, and so cause it to grow out in length: yea they would bind it up with swathing bands, that it might not grow round; but all in length: and by this custom it came to passe, that their heads afterward grew

grew such by nature. And in process of time, they were born with such heads; so that they needed not to be framed by handling; for whereas the generative seed is derived from all the parts of the body, round bodies yielding good seed, but crazie bodies unfound seed; and oftentimes bald fathers beget bald children; and beare-eyed fathers, beare-eyed children; and a deformed father, for the most part a deformed child; and the like also cometh to passe concerning other shapes: why should not also long-headed fathers generate long-headed children? But now they are not born with such heads, because that practise is quite out of use; and so nature, which was upheld by that custom, ceaseth together with the custom. So if we would produce a two-legged Dog, such as some are carried about to be seen; we must take very young whelps, and cut off their feet, but heal them up very carefully: and when they be grown to strength, join them in copulation with other dogs that have but two legs left; and if their whelps be not two-legged, cut off their legs still by succession, and at the last, nature will be overcome to yield their two-legged dogs by generation. By some such practise as you heard before, namely by handling, and often framing the members of young children, Mid-wives are wont to amend imperfections in them; as the crookednesse or sharpnesse of their noses, or such like.

CHAP. XIX.

Of the wonderful force of imagination; and how to produce partly-coloured births.

Plutark in his rehearsal of the opinions of Philosophers, writes, that *Empedocles* held that an infant is formed according to that which the mother looks upon at the time of conception: for, saith he, women were wont to have commonly pictures and images in great request, and to bring forth children resembling the same. *Hippocrates*, to clear a certain womans honesty that had brought forth children very unlike their parents, ascribed the cause of it to a certain picture which she had in her chamber. And the same defence *Quintilian* useth on the behalf of a woman, who being her self fair, had brought forth a Black-moor, which was supposed by all men to be her slaves son. *Damascen* reports, that a certain young woman brought forth a child that was all hairy; and searching out the reason thereof, he found the hairy image of *John Baptist* in her chamber, which she was wont to look upon. *Heliodorus* begins that excellent history which he wrote, with the Queen of *Ethiopia*, who brought forth *Chariclea* a fair daughter; the cause whereof was, the fable of *Andromeda* pictured in that chamber, wherein she lay with the King. We read of some others, that they brought forth horned children, because in the time of their coition they looked upon the fable of *Asiaron* painted before them. Many children have hare-lips, and all because their mothers being with child, did look upon a Hare. The conceit of the mind, and the force of Imagination is great; but it is then most operative, when it is excessively bent upon any such thing as it cannot attain unto. Women with child, when they long most vehemently, and have their minds earnestly set upon any thing, do thereby alter their inward spirits; the spirits move the blood, and so imprint the likeness of the thing mused upon, in the tender substance of the child. And surely all children would have some such marks or other, by reason of their mothers longing, if this longing were not in some sort satisfied. Wherefore the searchers out of secrets have justly ascribed the marks and signes in the young ones, to the imagination of the mother; especially that imagination which prevails with her in the chiefest actions, as in coition, in letting go her seed, and such like: and as man of all other living creatures, is most swift and fleeting in his thoughts, and fullest of conceits; so the variety of his wit affords much variety of such effects; and therefore they are more in mankind, then in other living creatures: for other creatures are not so divers minded, so that

they may the better bring forth every one his like in his own kind. *Jacob* was well acquainted with this force of imagination, as the Scriptures witness: for endeavouring

To bring forth party-coloured Sheep;

he took that course which I would wish every man to take, that attempts any such enterprize. He took certain Rods and Poles of Poplar, and Almond-tree, and such as might be easily barked, and cut off half the rind, piling them by white strokes, so that the Rods were white and black in several circles, like a Snakes colour. Then he put the Rods which he had piled, into the gutters and watering-troughs, when the Sheep came to drink, and were in heat of conception, that they might look upon the Rods. And the Sheep conceived before the Rods, and brought forth young of party-colours, and with small and great spots. A delightful sight it was. Now afterward, *Jacob* parted these party-coloured ones, about the time of conception: whereby it came to passe, that the other Sheep in their heat, beholding those that were party-coloured, brought forth Lambs of the like colour. And such experiments might be practised upon all living Creatures that bear wool; and would take place in all kinds of beasts; for this course will prevail even in

Generating party-coloured Horses;

A matter which Horse-keepers, and Horse-breeders do practise much; for they are wont to hang and adorn with tapestry and painted clothes of sundry colours, the houses and rooms where they put their Mares to take Horse; whereby they procure Colts of a bright Bay colour, or of a dapple Gray, or of any one colour, or of sundry colours together. And *Abjyrus* teacheth the same in effect; counselling us to cover the Mares body with some stuff of that colour, which we would have the Colt to be of: for look what colour she is set forth in, the same will be derived into the Colt; for the horse that covers her, will be much affected with the sight of such colours, as in the heat of his lust he looketh on; and will beget a Colt of the same hue as the example then before his eyes doth present unto him. *Oppianus* in his first book of Hunting, writes the same argument. Such is, saith he, the industry and practisedness of mans wit, that they can alter the colour of the young ones from the mother, and even in the wombe of their Dam procure them to be of divers colours: for the Horse-breeder doth paint the Mares back with sundry colours, (even such as they would procure to be in the Colt,) against the time that both she desires horse, & the Stallion is admitted to cover her. So the Stallion, when he cometh and sees such goodly preparation as it were for his wedding, presently begins to fume at the mouth, and to neigh after her, and is possessed with the fire of raging lust throughout his whole body, raving and taking on, that he cannot forthwith satisfy himself upon his bride. At length the Horse-breeder takes off their fetters, and lets them loose together; and the Mare admits him, and afterward brings forth a Colt of as many colours as she beheld in the time of her copulation; for as she conceives the Colt, so withal she conceives those colours which she then looks upon.

How to procure white Pea-cocks.

In former times, white Pea-cocks were such a rare sight in Colen, that every one admired them as a most strange thing: but afterward they became more common, by reason that merchants brought many of them out of Norway: for whereas black or else party-coloured Peacocks were carried into that Country to be seen, presently as they came thither, they waxed white; for there the old ones sit upon their eggs in the air, upon the tops of very high mountaines, full of snow; and by continual sitting there, it causeth some alteration in their own colour; but the young which they hatch, are white all over. And no doubt but some such courses will take

take good effect in all kinds of birds; for if we take their Cages or Coops wherein they are kept, and their nests wherein they sit, and white them on the inside with some plaiting work, or else cover them all over with white clothes or curtains, and so keep them in with grates, that they may not get out, but there couple and sit, and hatch their eggs, they will yeeld unto us white broods. So if you would

Procure Pigeons of party colours,

you must take that course which *Oppianus* hath set down. At such time, as they fall to kissing their mate, and are desirous of copulation, let him that keeps them lay before their eyes sundry clothes of the bravest colours they can get, but especially purple: for the pigeons will in their heat of lust be much affected and delighted with the sight thereof, and the young ones which they bring forth, shall resemble the same colours. The subtil Fowler, saith he, that gives himself to take and to bring up birds, is well acquainted with, and is wont to practise such experiments, and very artificially procures fine colours in young Pigeons: he casteth before their sparkling eyes fine wrought tapestry, and red coverlets, and purple garments; and so while he feeds their eyes with pleasing sights, he steals away their imagination to the colours which they look upon, and thereby derives the very same colours into the young ones.

How to procure a shag-hair'd Dog.

In fasting time you must strew their kennels, and the places where they lie and couple, and usually haunt, with the fleeces and hides of beasts; and so, while they continually look upon those sights, they will beget shag whelps like Lions. This we heard come to passe by chance, and without any such intended purpose, that a little Bitch lying continually in a Rams fleece, when she came to be with whelp, she brought forth puppies of the like hair as the fleece was.

How to procure Swine, and other beasts to be white.

Swine-herds, and Keepers of beasts, when they would have white litters, are wont to beautify, and to build the stables and places whither the beasts resort to lye, with white roofs and white eaves; and the Swine which were brought forth in such white sties, and the other beasts likewise that were brought forth in such whited places, became thereby white all over.

CHAP. XX.

How it may be wrought, that Women should bring forth fair and beautiful children.

BY this which hath been spoken, it is easie for any man to work the like effects in mankind, and to know how to procure fair and beautiful children. Nay, Writers make mention, that these things which we speak of, have oftentimes fallen out by chance. Wherefore it was not here to be omitted. The best means to produce this effect, is to place in the bed-chambers of great men, the images of *Cupid*, *Adonis*, and *Ganymedes*; or else to set them there in carved and graven works, in some solid matter, that they may always have them in their eyes: whereby it may to passe, that whensoever their wives lie with them, still they may think upon those pictures, and have their imagination strongly and earnestly bent thereupon; and not only while they are in the act, but after they have conceived and quickened also: so shall the child when it is born, imitate and expresse the same form which his mother conceived in her mind, when she conceived him, and bare in her mind, while she bare him in her wombe. And I know by experience, that this course will take good effect; for after I had counselled many to use it, there was a woman, who

with their black colour: it cometh by the industry of the Horie-breeder, who when they are yet tender and young, cunningly burns off their hair with an hot iron. But on the contrary, if you would have

The hairs of a wounded or galled place, to grow up of the same colour, as the other hair is of,

Tiberius hath taught the way how to do it. You must knead three pints of bruised or ground barley, and put to it the froth of nitre and a little salt, and make it into loaves; then you must put them into an Oven till they are burned to coals; afterward crush them, and beat them to powder, and then mix them with oyle, and anoint the sore or the scar therewith; and thus you must do for twenty daies. But what should be the reason that this barley ashes should cause, not white hairs, but the like in colour to the rest, to grow upon the scars or sores of horses whereupon it is cast, that, *Alexander Aphrodisiam* ascribes to this, because barley hath in it a purgative and cleansing force, and so waileth and expelleth the humors, and all the naughty stuff, that was gathered by the sore into that part, because it was maimed, and consequently nor so well able to relieve itself. Neither yet will I here omit that toyish experiment whereby we may

Procre in Oxen a counterfeite shew of fatnesse.

If you take an Ox well grown in years, and make a hole into his thigh, and blow wind thereby into him, and afterward give him meat, he will shew fat, though indeed he be very lean. We may also, by giving them some kind of water to drink

Cause the fleeces and hides of cattel to be of divers colours,

as *Ælianus* sheweth. The River Crathis affords one channel that makes beasts white: for Oxen and Sheep, and all four-footed beasts, as *Theophrastus* saith, as soon as they drink of it, become white, though before they were red or black. In Euboea, all for the most part, are white Oxen by nature. Sheep, by reason of the diversity of water which they drink, do diversly change their colour; the force and nature of the Rivers working this change in them, especially at every ramming time. Some are turned from black to white, and contrariwise, some are turned from white to black: these alterations are commonly seen neer to the River Antandrus, and neer also to a certain River in Thracia. The River Scamander, which is neer unto Troy, makes as many Sheep as drink of the water thereof, to become yellow. We may also conjecture and foresee by certain outward bodily signs in the Dam or Sire,

What colour their young ones will be of.

To foreknow the colour of young Mules, we must take special example of the hairs of their Dams ears and eye-lids: for howsoever the rest of their body is of one and the same colour, yet in those two parts we may discern so many and such colours as the foal shall have, as *Columella* writeth. So if you look under the Rams tongue, you shall there find certain veins; which if they be black, then will the Lambs be black also; but if they be white, then he hath begotten white Lambs: for look what colour these veins are of, with the same colour will the fleece of the Lambs be overspread; inasmuch that if there be sundry colours in them, there will be also sundry like colours upon the Lambs, as *Aristotle*, *Democritus*, and *Didymus* do witness. Now, how we may

Know by the eggs, whether the chick when it is hatcht, will be a Cock or a Hen,

Aristotle teacheth us: for, saith he, if the egge be exactly round, then it will yield

a Cock-chicken; but if it be somewhat long, then it yields an Hen-bird: the reason is, because in things that are round, the natural heat is more kindly and strongly compacted together.

How to make a bird sociable and familiar with thee.

Now we will speak of the sociableness and familiarity which a certain Pie had with a friend of mine: who by this pretty device did make the Pie so well acquainted with him, and so serviceable to him, that she would flie unto him, not only for the supplying of her daily wants, but as it were for love, never forsaking him night or day. The device was this. While she was yet unfeathered in the nest, he broke off her lower beak, even to her very jaws, that the poor wretch could not eat any meat but that which was put into her mouth with hands; and he himself gave her with his own hands all the meat she did eat. After that, she would flie to his trencher at dinner and supper, and would prate and chat unto him very flipant; inasmuch that nothing could be spoken in the house, but she would imitate it, and speak it again; and not only frame her tongue to their words, but her body also to the imitating and resembling of their actions. And he was wont still to leave her loose at home, and she would flie about everywhere, but still at dinner and supper times she would return home. It fell out that the man had occasion to go from home fifteen or sixteen days journey: she would alwayes bear him company, now and then flying a great way before him, and would sit still upon a bough till he came at her; and then she would leap upon his cap and his shoulders, frisking about him for very joy; and sometimes staying behind him; and then when he was gone a great way before, she would in all haste flie away after to overtake him; and she was also his continual bed-fellow; and yet to this day he hath her, and enjoyeth her familiar company. But, concerning the general transmutation and change of living creatures, let these things be sufficient which we have already spoken.



THE
THIRD BOOK
OF
Natural Magick:

Which delivereth certain precepts of Husbandry;
and sheweth how to intermingle sundry kinds of Plants,
and how to produce new kinds.

THE P R O E M E.

WE have rehearsed concerning divers kinds of new living Creatures; now shall I speak of Plants, which ravish with admiration the eyes and minds of those that contemplate on them, with their abundant pleasantness, and wonderful Elegancy. These bring more profit, and by these a natural Philosopher may seem more admirable. For if we made with the earth, is more honest and honourable then with other things; and the ground never grows old or barren, but is everywhere naturally rank to receive new seed, and to produce new; and is ever unsatisfied in fruitfulness, and brings perpetual increase: and if nature be always admirable, she will seem more wonderful in Plants. Copulation was but of one kind, here it is almost infinite; and not onely every Tree can be ingrafted into every Tree, but one Tree may be adulterated with them all. Living Creatures of divers kinds were not easily produced, and those that come from other Countries were hard to get: here is no difficulty at all: grafts are set and sent, if need be, to any part of the world. And if diversity of Creatures are made in Africa, by their copulating when they meet at the Rivers, that so new creatures are always produced; here in Italy, where the Air is always calme, and the Climate very indulgent, strange and wilde plants find a good harbour, and ground to grow in, which is the mother and nourisher of all, and so fruitful to produce new and diversity of plants, that it can hardly be exhausted. And we can better write of them, and know the truth more then others, because we have them still before our eyes, and an opportunity to consider of their effects. And if our Ancestors found many new things, we by adding to theirs, have found many more, and shall produce more excellent things overpassing them, because daily by our art, or by chance; by nature, or new experience, new plants are made. Diodorus writes, that the Vine at first was but one, and that was wilde; but now by the help of Bacchus alone, from the quality of the ground, the nature of the climate, and the art of planting, it is varied into many kinds, that it were madnesse to number them up, and not worth our time. Nature brought forth but one kind of Pear-tree: now so many mens names are honoured by it, that one is called Decumana, another Dolabelliana, and another is named from Decumius or Dolabella. The same thing is observed in Figges, of Livy and Pompey. Quinces are of many kinds; some thing is observed in Figges, of Livy and Pompey. Quinces are of many kinds; some called Mariana from Marius, Manliana from Manlius, Appiana Claudiana from some called Mariana from Marius, Appiana Claudiana from Appius Claudius, Cettiana from Cettius: their varieties have made the Authors names immortal. What shall I say of Laurel cherries, found in Pliny his time? what of Citrons? which as Athenæus saith, were too sharp to eat in the days of Theophrastus, and the ancients of Plutark and Pliny; but Palladius made them to become sweet. What of the Peach, and Almond-peach Nuts, fruits our fore-fathers knew not, yet now are they eaten, being pleasant and admirable? what of Clove-gillflowers, that the Gardeners Art hath made so dainty and sweet scented? and so of other plants I have everywhere set down in this work? Our Naples abounds so with them, that we would not go forth to see the Orchards of the Hesperides, Alcimus, Semiramis, and at Memphis, that were made to hang above ground. But I shall briefly and plainly relate the History.

Chap.

CHAP. I.

How new kinds of Plants may be generated of putrefaction.



AS we have shewed before, that new kinds of Living Creatures may be generated of putrefaction; so, to proceed in the same order as we have begun, we will now shew that new kinds of Plants may grow up of their own accord, without any help offered or such like. The Antients questionless were of opinion, that divers plants were generated of the earth and water mixt together; and that particular places did yield certain particular plants. We rehearsed the opinion of Diogenes before, who held that plants are generated of water putrified in it self, and a little earth tempered therewith. Theophrastus held, that the rain causeth much putrefaction and alteration in the earth; and thereby plants may be nourished, the Sun working upon it with his heating, and with his drying operation. They write also, that the ground when it is stirred, brings forth such kinds of Plants alwaies, as are usual in the same place. In the Isle Creta, the ground is of that nature, that if it be stirred anywhere, and no other thing sown or planted in it, it will of it self bring forth a Cypresse-tree: and their tilled lands, those that are somewhat moist, when they lie fallow, bring forth thistles. So the herb Lafer in Africa, is generated of a kind of pitchy or clammy rain and thick dirt; and the herb will shew it self out of the earth presently after the rain is fallen. Pliny said, that the waters which fall from above, are the cause of every thing that grows upon the earth, nature shewing therein her admirable work and power: and many such things they report, which we have spoken of in the books of the knowledge of Plants. And I my self have oft-times by experience proved, that ground digged out from under the lowest foundations of certain houses, and the bottom of some pits, and laid open in some small vessel to the force of the Sun, hath brought forth divers kinds of Plants. And whereas I had oftentimes, partly for my own pleasure, and partly to search into the works of Nature, sought out and gathered together earths of divers kinds, I laid them abroad in the Sun, and watered them often with a little sprinkling, and found thereby, that a fine light earth would bring forth herbs that had slight stalkes like a rush, and leaves full of fine little ragges; and likewise that a rough and stiff earth full of holes, would bring forth a slight herbe, hard as wood, and full of crevices. In like manner, if I took of the earth that had been digged out of the thick woods, or out of moist places, or out of the holes that are in hollow stones, it would bring forth herbs that had smooth blewish stalkes, and leaves full of juice and substance, such as Penny-wort, Purslane, Senegreek, and Stone-croppe. We made trial also of some kinds of earth that had been farre fetcht, such as they had used for the ballast of their Shippes; and we found such herbs generated thereof, as we knew not what they were. Nay further also, even out of very roots and barks of Trees, and rotten seeds, powned and buried, and there macecrated with water, we have brought forth in a manner the very same herbs; as out of an Oken root, the herb Polyopdy, and Oak-fern, and Splenewort, or at least such herbs as did resemble those, both in making and in properties. What should I here rehearse, how many kinds of road-stools and puff; we have produced? yea, of every several mixture of putrified things, so many several kinds have been generated. All which I would here have set down, if I could have reduced them into any method; or else if such plants had been produced, as I intended: but those came that were never

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sought

fought for. But happily I shall hereafter, if God will, write of these things, for the delight, and speculation, and profit of the more curious sort: which I have neither time nor leisure now to mention, seeing this work is ruffled up in haste. But let us see

How Toad-stools may be generated.

Dioscorides, and others have written, That the bark of a white Poplar-Tree, and of a black, being cut into small pieces, and sowed in dugged lands or furrows, will at all times of the year bring forth mulbromes, or toad-stools that are good to be eaten. And in another place he saith, that they are more particularly generated in those places, where there lies some old rusty iron, or some rotten cloth: but such as grow neer to a Serpents hole, or any noisome Places, are very hurtful. But *Tarentinus* speaks of this matter more precisely. If, saith he, you cut the stock of a black Poplar peece-meal into the earth, and pour upon it some leaven that hath been steeped in water, there will soon grow up some Poplar-toad-stools. He addeth further: If an up-land or hilly field that hath in it much stubble and many stalks of corn, be set on fire at such time as there is rain brewing in the clouds, then the rain falling, will cause many toad-stools there to spring up of their own accord: but if, after the field is thus set on fire, happily the rain which the clouds before threatened doth not fall; then, if you take a thin linnen cloth, and let the water drop through by little and little like rain, upon some part of the field where the fire hath been, there will grow up toad-stools, but not so good as otherwise they would be, if they had been nourished with a shower of rain. Next we will shew

How Sperage may be generated.

Dydymus writes, That if any man would have good store of Sperage to grow, he must take the horns of wilde Rams, and beat them into very small powder, and sow them in eared ground, and water it, and he shall have his intent. There is one that reports a more strange matter; that if you take whole Rams horns not powned into small pieces, but only cut a little, and make a hole in them, and so set them, they will bring forth Sperage. *Pliny* is of *Dydymus* opinion, that if the horns be powned and digged into the earth, they will yield Sperage; though *Dioscorides* thinks it to be impossible. And though I have made often trial hereof, but could not find it so to be, yet my friends have told me of their own experience, that the same tender seed that is contained within the Rams horn, hath produced Sperage. The same my friends also have reported

That Ivy doth grow out of the Harts horn;

and *Aristotle* writes of an Husband-man that found such an experiment; though for my own part I never tried it. But *Theophrastus* writes, that there was Ivy found growing in the Harts horn; whereas it is impossible to think how any Ivy seed could get in there; and whereas some alledge, that the Hart might have rubbed his horn against some Ivy roots, and so some part of the horn being soft and ready to putrifie, did receive into it some part of the root, and by this means it might there grow; this supposal carries no shew of probability or credit with it. But if these things be true, as I can say or see nothing to the contrary, then surely no man will deny but that divers kinds of plants may be generated of divers kinds of living Creatures horns. In like manner, may plants be generated of the putrified barks and boughs of old Trees: for so is

Polypody, and the herb Hypbear generated;

for both these, and divers other plants also, do grow up in Firre-trees, and Pine-trees, and such other for in many Trees, neer to the bark, there is a certain slegmatick or moist humour, that is wont to putrifie; which, when it abounds too much within, breaks forth into the outward shew of the boughs and the stock of the Tree; and

and there it meets with the putrified humour of the bark; and the heat of the Sun working upon it there, quickly turns it into such kinds of herbs.

CHAP. II.

How Plants are changed, one of them degenerating into the form of the other.

TO work Miracles, is nothing else (as I suppose) but to turn one thing into another, or to effect those things which are contrary to the ordinary course of Nature. It may be done by negligence, or by cunning handling and dressing them; that plants may forsake their own natural kind, and be quite turned into another kind; wholly degenerating, both in taste, and colour, and bignesse, and fashion: and this I say may easily be done, either if you neglect to dress or handle them according to their kind, or else dress them more carefully and artificially than their own kind requires. Furthermore, every plant hath his proper manner, and peculiar kind of sowing or planting; for some must be sowed by seed; others planted by the whole stem, others set by some root, others grafted by some sprig or branch: so that if that which should be sowed by seed, be planted by the root, or set by the whole stock, or grafted by some branch; or if any that should be thus planted be sowed by seed; that which cometh up will be of a divers kinde from that which grows usually, if it be planted according to its own nature, as *Theophrastus* writes. Likewise if you shall change their place, their air, their ground, & such like, you pervert their kind; and you shall find that the young growing plant will resemble another kind, both in colour and fashion; all which are clear cases by the books of Husbandry. Some examples we will here rehearse. If you would change

A white Vine into a black, or a black into a white;

sow the seed of a white Garden-Vine, and that which cometh of it, will be a black Wilde-vine; and so the seed of a black Garden-vine will bring forth a white Wilde-vine, as *Theophrastus* teacheth. The reason is, because a Vine is not sowed by seed, but the natural planting of it is by sprigs and roots. Wherefore if you deal with it otherwise then the kind requires, that which cometh of it must needs be unkindly. By the like means

A white Fig-tree may degenerate into a black,

for the stone of a Fig, if it be set, never brings forth any other but a wilde or a wood Fig-tree, and such as most commonly is of a quite contrary colour; so that of a white fig-tree it degenerates into a black, and contrariwise a black fig-tree degenerates into a white. Sometimes also, of a right and noble Vine is generated a bastard Vine, and that so different in kind oftentimes, that it hath nothing of the right garden-vine, but all merely wilde. In like manner also are changed

The red Myrtle and the red Bay-tree into black,

and cannot chuse but lose their colour: for these likewise degenerate, as the same *Theophrastus* reports to have been seen in *Asiandrus*; for the Myrtle is not sowed by seed, but planted by grafting; and the Bay-tree is planted by setting a little sprig thereof that hath in it some part of the root, as we have shewed in our discourse of Husbandry. So also are

Sweet Almonds and sweet Pomegranates changed into sowre ones.

for the stones or kernels of the Pomegranates are changed from their right blue, into a baser colour; and the Pomegranate itself, though it be never so good, degenerates into a hard, and commonly a sharp fruit. The Almond degenerates likewise both in taste, and also in feeling; for of a soft one cometh a harder: therefore we are counselled to graffe him when he is prettily well grown, or else to change him, and shift him oft. An Oak likewise will become worse: and therefore whereas the best grows in Epyrus, and many have planted the same elsewhere, yet they could never

never produce the like of this. In like manner, of the kernel of the natural Olive cometh a wilde Olive; (and they that say that the male Cypress-tree for the most part degenerates into a female;) and in proceffe of time there is such a change, that it agreeth in nothing with the natural Olive, but is so stark wilde, that sometimes it cannot bring forth fruit to any perfection. *Varro* saith that

Coleworts are changed into Rape, and Rape into Coleworts.

Old seed is of so great force in some things, that it quite changeth the nature; for the old seed of Coleworts being sowed, brings forth Rape; and contrariwise, old Rape seed degenerates into Coleworts. By labour also and dressing

The Corn Trophea, and Spelt, are changed into Wheat, and Wheat into them;

for this may be done, if you take them being of a thorough ripeness, and knead them, and then plant them; but this will not so prove the first nor the second year; but you must expect the proof of it in the third year, as *Theophrastus* sheweth. *Pliny* writeth, that the Corn Siligo is changed into Wheat the second year. So all seeds, either by reason that they are neglected, or because there is some indisposition either in the earth, or the air where they are, do oft-times degenerate from the excellency and goodness of their kind, and become worse. *Virgil* hath observed it: I have seen, saith he, the best and choicest things that were most made of, at length yet to degenerate, unless mans industry did yearly supply them with his help: so fatal it is for all things to wax worse and worse, and still to have need to be renewed. *Galen* saith, a man very studious of Husbandry, especially in his old age, bestowed great pains and diligence to find out, whether the annoyances of fruits, that which mars their pure goodness, did spring up of it self, or arise out of any seeds of the fruits themselves, which did degenerate into other kinds. Wherefore he took the purest, and the cleanest Wheat and Barley that he could get, and having picked out all other seed whatsoever, sowed them in the ground: and when he found much Tares growing in the Wheat, but very little in the Barley, he put the same experiment in other grain in practice; and at last found in Pulse a hard and round Ferch; and moreover, that the herb Axefeed did grow among Pulse, by a kind of degeneration of the Pulse into Axefeed. So, unless it be prevented by skill and pains,

The herb Ballamint will turn into a Mint.

Wherefore it must be often shifted and translated from place to place, lest it so degenerate, as *Theophrastus* counselleth; for when a man doth not look to it, and dresse it, the roots thereof will grow very large, and thereby the upper part being weakened, loseth the rankness of his savour; and that being lost, there remains in it but a weak smell, the very same in a manner that is in a common Mintr. I my self have sowed Mint seed, and it hath been changed into wilde Penny-royal; I mean, in favour onely: for the fashion of the Mint remained still in it. *Martial* writes, That

Basil-royal degenerates into wilde Betony,

if it be laid open to the Suns hottest and greatest force: for then it will bring forth sometimes purple flowers, sometimes white, and sometimes of a Rosie colour. And it will not only degenerate into Betony, but into Ballamint also. Likewise the boughs of the shrub Casia, as *Galen* reporteth, will degenerate into Cinamon. Likewise

Cloves, Roses, Violets, and Gilli-flowers, of purple, will become white,

either by reason that they are old, or else if they be not well looked unto. For *Theophrastus* records, that Violets, Roses, and Gilli-flowers, if they be not well heeded, in three years will wax white; and the experience thereof I my self have plainly seen. Neither yet will Plants degenerate one into another, only in such case as where there is a kind of vicinity and likeness of nature, but also where there

there is no such vicinity, one plant may be changed into another of a quite different kind: for

An Oak may be changed into a Vine.

Albertus reporteth, (if the thing be as true as it is strange; but let the truth thereof lie upon his credit) he reports, I say, that Oaken or Beechen boughs being ingrafted into the Tree Myrica, is quite changed into it; and so into the Tree called Tremilca, which is a baler kind of wood: and likewise if Oaken boughs be set in the ground of Alummum, a place so called, they will be quite altered into right Vines, such as their grapes yeeld good wine; and sometimes the old Oaks, if they be pared, degenerate into Vines. But we must not think that this change is made while those Trees or boughs last; but when once they are putrified, then the nature of the ground works into them, and changeth them into Vines.

CHAP. III.

How to make one fruit compounded of many.

AS we heard before of divers living Creatures, that they might be mingled into one, by copulation; so now we will shew also how to contrive divers kinds of fruits, by grafting into one fruit: for grafting is in plants the same that copulation is in living creatures: yet I deny not, but there are other means whereby this may be effected, as well as by grafting. But above all other, grafting is most praise-worthy, as being the best and fittest means to incorporate one fruit into another, and so of many to make one, after a wonderful manner. And whereas it may be thought a very toilsome, and indeed impossible matter, here the excellent effect of the work must sweeten all thy labour, and thy painful diligence will take away the supposed impossibility of the thing, and perform that which a man would think were not possible to be done. Neither must thou suffer thy self to be discouraged herein by the sayings of rude Husband-men which have attempted this thing, but for want of skill could not perform it, seeing experience teacheth thee that it hath been done. Wherefore against such discouragements, thou must arm thy self with a due consideration of such experiments as the Antients have recorded: as for example, that the Figge-tree may be incorporated into the Plane-tree, and the Mulberry-tree; and likewise the Mulberry-tree into the Chestnut-tree, the Turpentine-tree, and the white Poplar, whereby you mayest procure white Mulberries; and likewise the Chestnut-tree into a Hazel, and an Oak; and likewise the Pomegranate-tree into all Trees, for that it is like to a common whore, ready and willing for all Comers; and likewise the Cherry-tree into a Turpentine-tree: and to conclude, that every Tree may be mutually incorporated into each other, as *Columella* suppoeth. And this is the cause of every composition of many fruits into one, of every adopted fruit which is not the natural child, as it were, of the Tree that bare it; and this is the cause of all strange and new kinds of fruits that grow. *Virgil* makes mention of such a matter, when he saith, that *Dido* admired certain Trees which she saw, that bare new kinds of leaves, and apples that naturally were not their own. And *Palladius* saith, that Trees are joined together as it were, by carnal copulation, to the end that the fruit thereof might contain in it, all the excellencies of both the parents: and the same Trees were garnished with two sorts of leaves, and nourished with two sorts of juices, and the fruit had a double relish, according to both the kinds whence it was compounded. But now, as we did in our tract of the commixion of divers kinds of living Creatures; so here also it is meet to prescribe certain rules, whereby we may cause those divers plants which we would intermingle, to join more easily, and to agree better together, for the producing of new and compounded fruits. First therefore, we must see that either of the Trees have their bark of one and the same nature: and both of them must have the same time of growing and shooting out of their sprigs; as was required in living creatures, that both of them should have the same time of breeding their young

young ones: for if the graffe have a dry or a hard bark, and the stock have a moist or soft bark, or that they be any way contrary each to other, we shall labour in vain. Then we must see that the ingrafting be made in the purest and soundest place of the stock, so that it neither have any tumors or knobs, or any scars, neither yet hath been blasted. Again, it is very material, that the young grafts or shoots be fetcht from the most convenient place or part of the Trees; namely, from those boughs that grow toward the East, where the Sun is wont to rise in the Summer-time. Again, they must be of a fruitful kind, and be taken off from young plants, such as never bare fruit before. They must also be taken in their prime, when they are beginning first to bud, and such as are of two years growth, and likely to bear fruit in their second year. And the stocks into which they are to be engrafted, must likewise be as young as may be grafted into; for if they be old, their hardnesse will scarce give any entertainment to strange shoots to be planted upon them. And many such observations must be diligently looked into, as we have shewed in our book of Husbandry. But we must not here omit to speak of the lome, or that clammy mortar, which makes

The Graffe and the stock to close more easily together;

For it is very helpful to glew or fasten the skins of both the barks one into the other: and if the barks be of a divers nature, yet by this lome they may be so bound into one, that they will easily grow together. And surely it is commodious in many respects. First, because, as in mans body, the flesh being wounded or pierced into, is soon closed up again with stiffe and clammy plaisters applied thereunto; so the bark or the boughs of Trees being cut or rent, will close together again very speedily, by the applying of this mortar. For if you pill the bark off from a Tree, or slip off a little sprig from a bough, unlessse you close it up cunningly, that it may tick as sily every way in the grafting as whilst it grew, it will soon wither, and fade, and lose the natural juice and moisture; which inconvenience this lome will prevent, and fit them one into another. Moreover, if there be any open chink betwixt the bark and the Tree, presently the air getteth in, and will not suffer them to close; therefore to make it sure that they may close without fail, this lome is needful. And whereas there are some Trees which cannot away to be harboured in any of another kind, this lome will knit them so strongly into the stock, that they cannot but bud and blossom. But here we must observe, that this glue or mortar must be as neer of the nature of the thing engrafted as may be; for then it will perform this duty more kindly. If you be diligent herein, you may do many matters. We will give you a taste of some, that by these you may learn to do the like. Pill off the bark of Holly, and make a pit in some moist ground, and there bury your Holly rines, and let them there putrifie, which will be done in twelve daies: then take them forth, and stamp them till you see they are become a clammy slime. This is also made of the fruit Sebesten in Syria; and likewise it may be made of ordinary birdlime: but the best of all is made of the rines of Elm-roots stamped together; for this hath a special quality, both to fasten, and also to cherish. But let us return to grafting, which is of such great force, that it hath caused a new kind of a bastard fruit that was never heard of before, namely

An Apple compounded of a Peach-apple, and a Nut-peach;

which kind of compound generation, was never seen; nor heard of, nor yet thought upon by the Ancient. This is to be done by a kind of grafting which they call emplaistering. Take off two young fruitful sprigges, one from a Peach-apple Tree, and the other from the Nut-peach Tree; but they must be well grown, and such as are ready to budde forth. Then pare off the bark of them about two fingers breadth in compasse, so that the budde to be grafted may stand

stand sily in the midst betwixt them both; but you must do it charily, lest you perish the wood. Then cleave them thorough the middle a little way, that they may be let one into another, and yet the cleft not seen, but covered with the bud. Then take off a bud from one of those Trees, with the bark round about the bud, and set it into the midst of the boughs which we spake of before; and so engraft them together into the other Tree, having first cut out a round fit place for them therein. They must be engrafted in that part of the Tree, which is most neer and fresh-coloured; the sprigs that grow about that place must be cut off, lest they withdraw the nourishment from the graffe, which requires it all for it self. And when you have so done, binde it about gently, that you hurt it not; and cover it with somewhat, lest the rain fall down upon it; but especially take heed to the cleft, and the place where you pilld off the bark, that you plaister it up well with mortar. Thus if you do, the graffe will very kindly prosper, and the bud grow forth into a fruit that is compounded of both kinds; and it shall carry the hue both of the Peach-apple and the Nut-peach by equal proportion, such as was never seen before. By this means also we may procure the bringing forth

Of a Figge half white and half black;

for if we take the buds of each of them, pairing them off together with the bark round about them, and then cut them in the middle, and put the half of one, and the half of the other together, and so emplaister them into the Tree, as we spake before, the fruit thereof will be a Figge half white and half black. So also

Pomegranates may be brought forth, which will be sweet on the one side, and sowre on the other;

If you take either the shoots or the buds of each of them, and after you have divided them in the midst, put the half of each together, as before was spoken. But this may be done best upon the shoots or sprigs; for the bud can hardly be pared off, nor well divided, because the bark is so weak, and so thin, and slender, that it will not endure to be much or long handled. Likewise

Oranges compounded of divers kinds, and such as are half Limons; as also Limons half sweet, and half sowre, may be produced,

if we mix them after the same manner as we spake before; for these are very fit to be grafted by emplaistering; and these kinds of compound Oranges and Limons are very commonly to be seen in many Orchards in Naples. In like manner we may mingle and compound

A Peach of the white and the red Peach,

if we put those two kinds together, by such emplaistering: for there are of this compound fruit to be sold in Naples at this day. Likewise we may procure

A grape that hath a kernel or stone half black, and diversly coloured.

We must deal by the shoots of Vines, as we shewed before was to be done by the buds of other Trees; cleave them in the middle, and binde two shoots or more of divers sorts of Vines handlicely together, that they may grow up in one, and graft them into a fruitful Vine of some other kind. And the same which we have shewed concerning fruits, may be as well practised also upon flowers. As for example; if we would produce

Roses that are half white and half red;

we must take the sprigs of a white Rose, and of a red, and pare off the buds of each of them; and having cut them asunder in the middle, put the halves of each together, as we spake before, and engiaffe them artificially into the bark, and then have a diligent care still to cherish them; the compound bud will in due season bring forth Roses which will be white of the one side, and red of the other. But if you would

make trial hereof in Clove-gilli-flowers, and desire

To produce some that are half red,

seeing they have no buds at all, you must practise this experiment upon their root; you must take two roots of them, and cleave them in the middle, and match them fitly together, that they may grow each to other; and binde them up well, and then will they yeeld compound Clove-gilli-flowers: of which kind we have great store, and they are common amongst us everywhere; and they do not onely bring forth party-coloured flowers, but the very same bough, and one and the same sprig, will bear white ones and red ones, and such as are wrought and as it were embroidred with divers goodly colours, most pleasant to be seen.

CHAP. IV.

Of a second means whereby fruits may be mingled and compounded together.

There is also a second way of compounding divers kinds of fruits together; namely, by another manner of grafting. As for example; If we would produce

Pomegranates compounded of divers kinds,

Theophrastus sheweth us how to do it. We must take the young slips or branches of divers kinds, and bruise them with a Beetle, so that they may stick and hang together; and then binde them up very hard each to other, and set them in the ground: and if they be well laid together, all those slips will grow up jointly into one Tree; but so, that every one of them retains his own kind, and receives his several nourishment by it self, and severally digests it: and the chief community which they have all together, is their mutual embracing each of other. The same *Theophrastus* teaches us in the same place,

How one and the same Vine-branch may bring forth a black and a white grape both together; and how in the same grape may be found a white and black stone hanging together.

Take the branch of a white Vine, and another of the black, and the uppermost half of either of them must be bruised together; then you must match them equally, and binde them up together, and plant them: for by this means they will grow up both into one joint; for every living thing may be matcht with another, especially where one is of the same or the like kind with the other: for then if they be dissolved, as these are in some sort when they are bruised, their natures will easily close together, and be compact into one nature: but yet either of these branches hath his several nourishment by it self, without confusion of both together; whereby it cometh to passe, that the fruit arising from them is of a divers nature, according as either of the sprigs requireth. Neither ought this to seem strange, that both of them concurring into one, should yet retain each of them their severall kind, seeing the like hereof may be found in certain Rivers which meet together by confluence into one and the same channel, and yet either of them keeps his own several course and passage; as do the Rivers Cephissus and Melas in Bœotia. *Columella* teacheth us to do this thing on this manner. There is, saith he, a kind of engraffing, whereby such kind of grapes are produced, as have stones of divers kinds, and sundry colours; which is to be done by this means. Take four or five, or more (if you will) Vine-branches of divers kinds, and mingle them together by equal proportion, and so binde them up. Afterward put them into an earthen pipe or a horn fast together; but so, that there may be some parts of them seen standing out at both ends; and those parts so standing forth, must be dissolved or bruised; and when you have so done, put them into a trench in the ground, covering them with muck; and watering them till they begin to bud. And when the buds are grown fast together, after two or three years, when they are all knit and closed into one, then

then break the pipe, and neer about the middle of the stalk beneath the sprouts, there where they seem to have most grown together, cut off the Vine, and heal that part where it is so cut, and then lay it under the ground again about three fingers deep: and when that stalk shall shoot up into sprigs, take two of the best of them, and cherish them, and plant them in the ground, casting away all the other branches; and by this means you shall have such kinds of grapes as you desire. This very same experiment doth *Pliny* set down, borrowing it of *Columella*. But *Didymus* prescribes it on this manner. Take two Vine-branches of divers kinds, and cleave them in the middle; but with such heedful regard, that the cleft go as far as the bud is, and none of the pith or juice be lost; then put them each to other, and close them together, so that the bud of either of them meet right one with the other: and as much as possibly may be, let them touch together, whereby both those buds may become as one, then binde up the branches with paper as hard together as you can, and cover them over with the Sea-onion, or else with some very stiff clammy earth; and so plant them, and water them after four or five daies, so long till they shoot forth into a perfect bud. If you would produce

A Fig, that is half white, and half red;

Leontinus teacheth you to do it after this manner. Take two shoots of divers kinds of Fig-trees; but you must see that both the shoots be of the same age, and the same growth as neer as you can: then lay them in a trench, and dung them, and water them. And after they begin to bud, you must take the buds of each, and binde them up together, so that they may grow up into one stalk: and about two years after, take them up, and plant them into another stock, and thereby you shall have Figs of two colours. So then by this means

All fruits may be made to be party-coloured;

and that not onely of two, but of many colours, accordingly as many kinds of fruits may be compounded together. And surely these experiments are very true, though they be somewhat hard to be done, and require a long times practice, as I my self have had experience. The like experiment to these is recorded by *Palladius*, and by other Greek Writers, who shew the way

How a Vine may bring forth clusters of grapes that are white, but the stones of the grapes black.

If white and black Vines grow neer together, you must shred the branches of each, and presently clap them together so, that the bud of either may meet right together, and so become one: then binde them up hard in paper, and cover them with soft and moist earth; and so let them lie three dayes or thereabouts: after that, see that they be well and fitly matcht together, and then let them lie till a new bud come forth of a fresh head: and by this means you shall procure in time, divers kinds of grapes, according to the divers branches you put together. I my self have made choice of two shoots of two divers Vines growing one by another; I have cleft or cut them off in that place where the buds were shooting forth, leaving the third part of the bud upon the branch; I fastened them together, and bound them up into one very fast, lest when the buds should wax greater, one of them might slide off from the other: I fitted them so well, branch with branch, and bud with bud, that they made but one stalk; and the very same year they brought forth grapes that had cloven kernels or stones. This shoot so springing up, I put to another; and when that was so sprung up, I put that also to another; and by this continual fitting of divers sprigs one to another, I produced clusters of divers-coloured and divers-natured grapes: for one and the same grape was sweet and unsavoury; and the stones were some long, some round, some crooked; but all of them were of divers colours. *Pontanus* hath elegantly shewed

How Citron-trees may bear divers kinds;

namely, by joining two sundry boughs together, after the bark hath been pared away,

away, and fastning each to other with a kind of glue, that they may grow upon as fast as the other; and when they are engrafted into one stock, they must be very carefully covered and looked unto, and so one and the same branch will bring forth fruit of divers kinds. So you may procure

An Orange-tree to bring forth an Apple half sweet and half sour.

And this kind of commixtion was invented by chance; for there were grafted two boughs of Orange trees, one brought forth a sweet, and the other a sharp fruit. When occasion served to transplant and remove the Tree, it was cut off in the middle, according as Husband-men are wont to do when they plant such Trees after they are grown old; and by great chance, it was cut off there where the two boughs had been before engrafted: and so when the stock budded afresh, there arose one bud out of the sharp and sweet branches both together as they were left in the stock; and this one bud brought forth Apples or fruit of both relishes. Wherefore no question but such a thing may be effected by art, as well as it was by chance, if any man have a minde to produce such kind of fruits.

CHAP. V.

Of a third way, whereby divers kinds of fruits may be compounded together.

WE will also set down a third way, whereby we may mingle and compound divers kinds of fruits together. A way which hath been delivered unto us by the Ancients, though for my own part I think it to be not only a very hard, but even an impossible matter. Notwithstanding, because grave Ancient Writers have set it down, I cannot scorn here to rehearse it: and though I have put it in practice, but to no purpose, for it hath not so fallen out as they write, yet I will not discourage any man that hath a mind to make trial hereof; for it may be that fortune will second their endeavours better then he did mine. The way is this; to gather many seeds of sundry Trees and fruits, and wrapping them up together, so to sow them: and when they are grown up into stalks, to bind all the stalks together, that they may not lie aunder, but rather grow up all into one Tree; and this Tree will bring forth divers kinds of fruits, yea and one and the same fruit will be mingled and compounded of many. It should seem that the Authors of this experiment, learned it first out of *Theophrastus*, who writes, that, If you sow two divers seeds near together within a hands breadth, and then sow two other divers seeds a little above them, the roots which will come of all these seeds will lovingly embrace and winde about each other, and so grow up into one stalk or stock, and be incorporated one into another. But special care must be had how the seeds be placed; for they must be set with the little end upward, because the bud cometh not out of the low and hollow parts, but out of the highest. And there are four seeds required, because so many will easily and fitly close together. A matter, which if it were true, it might be a very ready means which would produce exceeding many and wonderful experiments. By such a means

Berries that are partly-coloured may be produced.

If you take a great many berries, white, and black, and red, one amongst another, and sow them in the earth together; and when they are shot up, bind all their stalks into one, they will grow together, and yeeld partly coloured berries. *Pliny* writes, that this way was devised from the birds; Nature, saith he, hath taught how to graffe with a seed: for hungry birds have devoured seeds, and having moistened and warmed them in their bellies, a little after have dunged in the forkie twines of Trees, and together with their dung excluded the seed whole which erst they had swallowed: and sometimes it brings forth there where they dung it, and sometimes the wind carries it away into some chinks of the barks of Trees, and there it brings forth. This is the reason why many times we see a Cherry-tree growing in a Willow,

ow, a Plane-tree in a Bay-tree, and a Bay in a Cherry-tree; and withal, that the berries of them have been partly-coloured. They write also, that the Jack-daw hiding certain seeds in some secret chinks or holes, did give occasion of this Invention. By this self-same means we may produce

A Fig that is partly white and partly red.

Leonius attempts the doing of this, by taking the kernels or stones that are in a Fig somewhat inclinable to this variety, and wrapping them up together in a linnen cloth, and then sowing them, and when need requires, removing them into another place. If we would have

An Orange or Citron-tree bear divers Apples of divers relishes;

Pontanus our Country-man, in his work of Gardening, hath elegantly taught us how to do it. We must take sundry seeds of them, and put them into a pitcher, and there let them grow up: and when they come forth, bind the sprigs together, and by this means they will grow up into one stock, and throwd themselves all under one bark: but you must take heed that the wind come not at them to blow them aunder, but cover them over with some wax, that they may stick fast together; and let them be well plaistered with mortar about the bark: and so shall you gather from them in time very strange Apples of sundry relishes. Likewise we may procure

A Damask, and an Orange or Limon to be mixt together.

In our books of Husbandry, we shewed at large, by many reasons alledged to and fro, that sundry seeds could not possibly grow into one; but all that is written in favour of this practice, is utterly false, and altogether impossible. But this experiment we our selves have proved, whereby divers kinds of Damasks are mixt together. While the Damask-trees were very tender and dainty, we fastened two of them together, which were planted neer to each other, as Sailors plait and tie their Cables: but first we pared off the bark to the inmost skin, in that place where they should touch together, that so one living thing might the more easily grow to the other: then we bound them up gently with thin lints, made of the inner bark of Elm, or such like stuff that is soft and pliable for such a purpose, lest they should be parted and grow aunder; and if any part of them were so limber that it would not stick fast, we wedged it in with splents; yet not too hard, for fear of spoiling it. Then we rid away the earth from the upper roots, and covered them with muck, and watered them often, that by this cherishing and tilling on, they might grow up the better: and thus after a few years that they were grown together into one tree, we cut off the tops of them about that place where they most seemed to be knit together; and about those tops there sprung up many buds; whereof, those which we perceived had grown out of both Trees, we suffered to grow still, and the rest we cut away; and by this means we produced such kind of fruit as we speak of, very goodly, and much commended. And concerning Limons, I have seen some in the Noble-mens Gardens of Naples, which, partly by continual watering at seasonable times, and partly by reason of the tendernes and the ranknesse of the boughs, did so cling and grow together, that they became one tree; and this one Tree brought forth fruit compounded of either kind. We may also effect this featly by earthen vessels; for the plants that are set therein, we may very conveniently cherish up with continual watering, and perform other services towards them which are necessary for their growth. And as it may be done by Limons, so we have seen the same experiment practised upon Mulberry-trees, which growing in moist and shadowed places, as soon as their boughs closed one with another, presently they grew into one, and brought forth berries of sundry colours. If we would procure that

A Lettice should grow, having in it Parsley, and Roichit, and Basil-gentle, or any such like commixtion, we must take the dung of a Sheep or a Goat; and
though

though it be but a small substance, yet you must make a shift to bore the Trutle through the middle, and as well as you can, get out the inmost pith, and in stead thereof put into it those seeds which you desire to have mingled together, packing them in as hard as the Trutle will bear it: and when you have so done, lay it in the ground about two handfull deers, with dung and hollow geer, both under it, and round about it; then cover it with a little thin earth, and water it a little and a little; and when the seeds also are sprung forth, you must still apply them with water and dung; and after they are grown up into a stalk, you must be more diligent about them; and by this means at length there will arise a Lettice, mixed and compounded with all those seeds. *Palladius* prescribes the same more precisely. If you take, saith he, a Trutle of Goats dung, and bore it through, and make it hollow cunningly with a bodkin, and then fill it up with the seed of Lettice, Cresses, Basil, Rorcher, and Radish, and when you have so done, lap them up in more of the same dung, and bury them in a little trench of such ground as is fruitful and well manured for such a purpose, the Radish will grow downward into a Root, the other seeds will grow upward into a stalk, and the Lettice will contain them all, yielding the several relish of every one of them. Others effect this experiment on this manner. They pluck off the Lettice leaves that grow next to the root, and make holes in the thickest substance and veins thereof, one hole being a reasonable distance from the other; wherein they put the forenamed seeds, all but the Radish seed, and cover them about with dung, and then lay them under the ground, whereby the Lettice grows up, garded with the stalks of so many herbs as there were seeds put into the leaves. If you would procure

Party-coloured flowers to grow;

you may effect it by the same ground and principle. You must take the seeds of divers kinds of flowers; and when you have bound them up in a Linen cloth, set them in the ground, and by the commixtion of those seeds together, you shall have flowers that are party-coloured. By this means, it is thought that Daisies of divers kinds were first brought forth, such as are to be seen with golden leaves, reddish about the edge; nay some of them are so meddled with divers colours, that they resemble little threads of silk patcht together.

CHAP. VI.

How a double fruit may be made, whereof the one is contained within the other.

There is also another way of Composition, whereby fruits may be so meddled together, not as we shewed before, that one part of it should be of one fruit, and the other part of another kinde; nor yet that one and the same bough shall at once bear two or three several kinds of fruits; but that one and the same fruit shall be double, containing in it self two several kinds, as if they were but one; whereof I my self have first made trial. But let us see how the Ancients have effected this: and first

How to make an Olive-grape.

Diophanes sheweth that the Olive being engrafted into the Vine, brings forth a fruit called *Eleo-staphylon*, that is to say, an Olive-grape. But *Florentinus* in the eleventh book of his *Georgicks*, hath shewed the manner how to engraft the Olive into a Vine, that so it shall bring forth not only bunches or clusters of grapes, but an Olive fruit also. We must bore a hole through the Vine neer to the ground, and put into it the branch of an Olive-tree, that so it may draw and receive both from the Vine, sweetness; and also from the ground, natural juice and moisture, whereby it may be nourished: for so will the fruit taste pleasantly. And moreover, if, while the Vine hath not yet born fruit, you take the fruitful sprigs thereof, and plant them elsewhere, these sprigs will retain the mixture and composition of the Vine

Vine and the Olive-tree together, and bring forth one fruit that shall have in it both kinds, which therefore is called by a name compounded of both their names, *Eleo-staphylon*, an Olive-grape. He reports that he saw such a tree in the Orchard of *Marinus Maximus*; and tasting the fruit thereof, he thought with himself that he felt the relish of an Olive-berrie and a grape kernel both together. He writes also that such plants grow in Africa, and are there called by a proper name in their Country language *Ubolima*. But we must set props under them, to bear up the weight and burden of the boughs: though if we engraft them any other way but this, we shall need no polls at all. I suppose also that by this self-same means it may be effected,

That a Grape should have Myrtle in it.

Tarentinus writes, that the Vine may be engrafted into the Myrtle-tree, and the Vine-branches thereon engrafted, will bring forth grapes that have Myrtle-berries growing underneath them. But the manner of this engrafting he hath not set down. If you engraft the Vine-branches in the higher boughs or arms of the Myrtle, then they will bring forth grapes after their ordinary manner, not having any Myrtle in them: but if you engraft them as the shewed before, neer to the ground, as the Olive-tree must be into the Vine, then you may produce Myrtle-grapes, though not without some difficulty. We may likewise produce

Damofins that shall be of the colour of Nuts;

for such kind of fruit were produced by the Ancients, and called *Nucipruna*, that is, Nut-Damofins, as *Pliny* reporteth. It is a peculiar property of these fruits that are engrafted into Nut-trees, that they are in colour like to their own kinde, but in taste like unto Nuts; being therefore called by a mixt name, *Nuci-pruna*. So there may be produced, as the same *Pliny* writes,

Damofins that have sweet Almonds within them.

There is, saith he, in this kind of fruit an Almond-kernel, neither can there be any prettier double fruit devised. The same *Pliny* reports also, that there is a kind of

Damofin that hath in it the substance of an Apple,

which of late was called by the Spaniards *Malina*, which cometh of a Damofin engrafted into an Apple-tree. There is also a kind of fruit called by the Apothecaries *Sebesten*, or

Mixa, which hath in it a sweet Almond.

This same *Mixa* is a kind of Damofin, which differs from all others; for whereas others have a bitter Almond or kernel within their stone, this only hath a sweet kernel. It is a plant peculiar to Syria and Egypt, though in *Plinies* time it was common in Italy, and was engrafted in the Service-tree, whereby the kernel was the pleasanter. They engrafted it into the Service-tree, likely for this cause, that whereas the fruit of it self would make a man laxative, the sharp taste of the Service being mixed with it, might cause it to be more binding. But now we will shew

How to produce an Almond-peach, which outwardly is a Peach, but within hath an Almond-kernel.

The former means producing double fruits, which the Ancients have recorded, are but vain fables; not only false matters, but indeed impossible to be so done: for, we shewed in the book of Husbandry, if you engraft the Vine into the Myrtle, there will be no such fruit brought forth after that manner. Besides, it is impossible to engraft the Olive-tree into the Vine; or if it were engrafted, yet would

would it not bring forth any such grapes. *Pliny* speaks of Apple-damofins, and Nut-damofins; but he sheweth not the manner how they may be produced; happily, because it was never seen nor known. But we will demonstrate the manner of it to the whole world, by this example: this fruit is called an Almond-Peach by the late Writers, because it bears in itself the nature, both of the Almond and the Peach compounded together. And it is a new kind of Adultery or commixtion, wrought by skill and diligence used in grafting; such a fruit as was never heard of in former ages, partaking both of the shape, and also of the qualities of either parent: outwardly it resembles the Peach both in shape and colour; but inwardly it hath a sweet Almond within the kernel, that both looks and tastes like an Almond; and so is the Tree also a middle betwixt the Almond-tree and the Peach-tree, outwardly like the Peach-tree, and inwardly like the Almond-tree. The manner of engrafting is, by clapping the bud of one upon the bud of another; either upon one of the trees that bare one of the buds, or else setting them both into a third tree, as we have done when the Trees have been old. We may also go farther, and upon that branch wherein those two buds grow up together, we may set a third bud, and so the fruit will be threefold. These trees we had growing in our own Orchards many years together. By this self-same means we may produce a very strange Apple; the wonderfulness whereof will ravish our senses and our thoughts; namely

A Citron that hath a Limon in the inner part:

and this, I say, we may produce by laying the bud of a Citron upon the bud of a Limon. And the most of those kinds are to be found among the *Brutii*, a people dwelling neer Naples, and the *Surrentines* in Campania; and these fruits proceed from the tart juice that is within the branch. In like manner

A double Orange may be produced;

which kind of fruit is common with us, wherein are double ranks of kernels in such rare proportion, that you would wonder and be amazed to see.

CHAP. VII.

Of another device, whereby strange fruits may be generated, and made either better or worse.

Concerning the praises and excellency of engrafting, we have spoken elsewhere more at large: Here it shall suffice onely to shew, that by engrafting, new fruits may be produced, some better, and some worse then their ordinary kinds. We will relate some experiments of our own, and some which the Antients have found out. And first

How to produce a Chest-nut of the best.

There is one rare example hereof not to be omitted. *Corellius*, a Noble-man of Rome, born at the City Ateste, engrafted a Chest-nut upon a Chest-nut branch, in the Country of Naples, and so produced a Chest-nut called *Corelliana*, after his name. After that, his Heir, whom he made a Free-man, grafted the same *Corelliana* upon another Tree: the difference betwixt them both is this, that the former is a larger Chest-nut, but this latter is a better fruit. These things have been done by the Antients: and the good that cometh by engrafting is such, as that if any thing be engrafted into a stock or branch of its own kind, the fruit will thereby be made better. The Cherry-tree is very kindly to be engrafted: and you shall scarce ever have a good and a sweet Cherry, unless it be by engrafting upon some other Tree, as *Pamphilus* reporteth. By the president of this example, we have endeavoured to change

The Barbary-Tree into the Tree called Tuber:

for I take it, that the *Oxyacantha*, or the Barbary-tree, is nothing else but a bastard, or

or a wild Tuber: and therefore if a man follow that example of *Corellius*, and engraft the *Oxyacantha* oftentimes into the own branch or stock, it will be much bettered, and become the Tuber-tree: as also on the other side, the Tuber-tree, if it be not dressed and looked unto, doth degenerate into the Barbary-tree. I myself have engrafted it three or four times into the branches of its own kind, in my own Orchard; and if I live so long, I will still engraft it so, till it do bring forth Tubers; for I find that it brings forth already, both greater and sweeter berries. Now we will speak of such fruits, as are engrafted not into their own branches, but into branches of another kind, which contain in them both the fashion and the properties of either kind: and we will teach the manner how to compound a new kind of fruit lately devised, namely

A Peach-nut, mixed of a Nut and a Peach.

There is a kind of Peach called a Peach-nut, which the Antients never knew of; but hath lately been produced by pains taken in grafting, as I myself have seen. It bears the name and the form also of both the parents whereof it is generated; having a green colour like a Nut, and hath no mofse down on the out-side, but very smooth all over; the taste of it is sharp and somewhat bitter; it is long ere it be ripe, and is of a hard substance like a Peach. That part of it which lies against the Sun is reddish; it smells very well; it hath within, a rough stone, and hard like a Peach-stone; it hath a pleasant relish; but the apple will not last so long as the Nut, or kernel within. Which kind of fruit cannot be supposed to have been otherwise brought forth then by divers engraftings of the Peach into the Nut-tree, one year after another. We may also better the fruits by engrafting them into better Trees. *Diophanes* produced

Citron-apples compounded of an Apple and a Citron.

for he engrafted an Apple into the Citron-tree, and that oftentimes; but it withered as soon as ever it did shoot forth: howbeit, at length it took fast hold, and became a Citron-apple-tree. *Anatolius* and *Diophanes* made a compound fruit called

Melimela, of an Apple and a Quince mixt together;

for if we engraft an Apple into a Quince-tree, the Tree will yield a very goodly apple, which the Athenians call *Melimelum*, but we call it a *St. Johns Apple*. *Pliny* writes, that an ordinary Quince, and a Quince-pear being compounded,

Produce a fruit called Milviana.

The Quince, saith he, being engrafted into a Quince-pear, yieldeth a kind of fruit called *Milvianum*, which alone of all other Quinces is to be eaten raw. Now as we have shewed how to make fruits better by engrafting, both for shew and for properties, we will declare also, how by engrafting

Fruits may be made worse.

We will shew it first by a Pear. *Marcus Varro* saith, that if you engraft a very good Pear into a wilde Pear-tree, it will not taste so well as that which is engrafted into an Orchard Pear-tree. If you engraft a Peach into a Damofin-tree, the fruit of it will be much less: if into a bitter Almond-tree, the fruit will have a bitter relish. Likewise if you graffe a Chest-nut into a Willow, and be somewhat a latter fruit, the taste of it will be more bitter. And so if you graffe an apple into a Damofin-tree, the fruit which it yields, will neither be so great, nor yet so good, as it is in the own kind.

CHAP. VIII.

How to procure ripe fruits and flowers before their ordinary season.

As being as it were Natures Ape, even in her imitation of Nature, effecteth greater matters then Nature doth. Hence it is that a Magician being furnished with Art, as it were another Nature, searching thoroughly into those

works which Nature doth accomplish by many secret means and close operations, doth work upon Nature, and partly by that which he sees, and partly by that which he conceits and gathers from thence, takes his sundry advantages of Natures instruments, and thereby either hastens or hinders her work, making things ripe before or after their natural season, and so indeed makes Nature to be his instrument. He knows that fruits, and flowers, and all other growing things that the world affords, are produced by the circuit and motion of celestial bodies; and therefore when he is disposed to hinder the ripening of any thing, or else to help it forward, that it may be more rare and of better worth, he effects it by counterfeiting the times and seasons of the year, making the Winter to be as the Summer, and the Spring-time as the Winter. Amongst other means, engrafting is not a little helpful hereunto. Wherefore let us see, how we may by engrafting

Produce Grapes in the Spring-time.

If we see a Cherry-tree bring forth her fruit in the Spring-time, and we desire to have Grapes about that time, there is fit opportunity of attaining our desire, as *Tarentinus* writeth. If you engraft a black Vine into the Cherry-tree, you shall have Grapes growing in the Spring-time: for the Tree will bring forth Grapes the very same season, wherein it would bring forth her own fruit. But this engrafting cannot be without boring a hole into the stock, as *Didymus* sheweth. You must bore the Cherry-tree stock through with a wimble, and your Vine growing by it, you must take one of the next and goodliest branches thereof, and put it into the auger-hole; but you must not cut it off from the Vine, but place it in as it grows: for so the branch will live the better, both as being nourished by his own mother the Vine, and also as being made partaker of the juice of that Tree into which it is engrafted. This sprig within the compass of two years, will grow and be incorporated into the Cherry-tree: about which time, after the stock is grown over again, you must cut off the branch from the Vine, and saw off the stock of the Cherry-tree wherein it is engrafted, all above the boring place, and let the Vine-branch grow up in the rest: for so shall neither the Vine be idle, but still bring forth her own fruit, and that branch also which was engrafted doth grow up together with it, being nothing hurt by that engrafting. We may also by the help of engrafting procure

A Rose to shew forth her buds before her time.

If we pluck off a Rose-bud from the mother, and engraft by such an emplanting as we spake of before, the same into the open bark of an Almond-tree, at such time, as the Almond-tree doth bud, the Rose so engrafted, will bring forth her own flowers out of the Almond bark. But because it is a very hard matter to engraft into an Herbe, and therefore we can hardly procure flowers sooner than their time by that means, we will shew another means hereof; And namely,

How Cucumbers may hasten their fruits.

Columella found in *Doilus Mendesium* an Egyptian, an easie way whereby this may be done. You must set in your Garden in some shadowy place well dunged, a rank of Fenel, and a rank of Brambles one within another; and after the equinoctial day, cut them off a little within the ground; and having first loosed the pith of either of them with a wooden puncheon, to convey dung into them, and withal to engraft in them Cucumber-seeds, which may grow up together with the Fenel and the Brambles: for by this means the seeds will receive nourishment from the root of the stalk into which they are engrafted, and so you shall have Cucumbers very soon. But now let us shew how we may accomplish this thing by counterfeiting as it were the seasons of the year: and first, how we may procure that

Cucumers

Cucumbers shall be ripe very timely.

The Quintiles say you must take panniers or earthen pots, and put into them some fine mixed earth mixed with dung, that it may be somewhat liquid, and preventing the ordinary season, you must plant therein Cucumber-seeds about the beginning of the Spring, and when the Sun shines, or that there is any heat or rain, they bring the panniers forth into the Air, and about Sun-setting they bring them into a close house; and this they do daily, still watering them as occasion serveth. But after that the cold and the frost is ceased, and the Air is more temperate, they take their panniers and digge a place for them in some well-tilled ground, and there set them, so that the brims thereof may be even with the earth; and then look well to them, and you shall have your desire. The like may be done by Gourds. *Theophrastus* sheweth, that if a man sow Cucumber seeds in the Winter-time, and water them with warm water, and lay them in the Sunne, or else by the fire, and when seed-time cometh, put whole panniers of them into the ground, they will yield very timely Cucumbers, long before their ordinary season is to grow. *Columella* saith, that *Tiberius* the Emperour took great delight in the Cucumbers that were thus ripened, which he had at all times of the year; for his Gardners every day drew forth their hanging Gardens into the Sun upon wheels, and when any great cold or rain came, they straightwayes carried them in again into their close hovels made for the same purpose. *Didymus* sheweth

Roses may bud forth, even before Winter be past,

if they be used after the like manner; namely, if you set them in hampers or earthen vessels, and carefully look unto them, and use them as you would use Gourds and Cucumbers, to make them ripe before their ordinary season. *Pliny* sheweth

How to make Figs that were of last years growth, to be ripe very soon the next year after; and this is by keeping them from the cold too, but yet the device and practice is not all one with the former. There are, saith he, in certain Countreies, as in *Mæcia*, Winter Fig-trees, (a small tree it is, and such as is more beholding to Art than to Nature) which they use on this manner. After the Autumn or Fall, they lay them in the earth, and cover them all over with muck, and the green Figs that grew upon them in the beginning of Winter are also buried upon the Tree with them. Now when the Winter is past, and the Air is somewhat calmer the year following, they dig up the Trees again with the fruit upon them; which presently do embrace the heat of a new Sun as it were, and grow up by the temperature of another year, as kindly as if they had then new sprung up: whereby it cometh to passe, that though the Countrey be very cold, yet there they have ripe Figs of two years growth as it were, even before other Fig-trees can so much as blossom. But because we cannot so well practise these experiments in the broad and open fields, either by hindering, or by helping the temperature of the Air, therefore we will assay to ripen fruit and flowers before their time, by laying warm cherifiers, as lime, or chalk, and nitre, and warm water, to the roots of Trees and herbs. If you would have

A Cherry ripe before his time,

Pliny saith, that you must lay chalk or lime to the root of the Tree before it begin to blossom; or else you must oftentimes pour hot water upon the root; and by either of these means you may procure the ripening of Cherries before their time: howbeit afterward the Trees will be drie and wither away. If you would procure the ripening

Of a Rose before his time;

Didymus saith you may effect it by covering the Rose-bush with earth, a foot above the root of it, and there pour in warm water upon it, whilst the slippe beginneth

beginneeth to shoot up, and before any blossom appeareth. Likewise if you would have

A Vine to bring forth before her time,

you must take nitre, and pown it, and mix it with water, so that it be made of the thicknesse of hony: and as soon as you have pruned the Vine, lay good store of your nitre upon the Vine-buds, and so shall your buds shoot forth within nine days after. But to procure the Grapes to be timely ripe, you must take the mother of the wine before it is become fowre, and lay the same upon the root of the plants when you set them; for at that time it is best so to use them, as *Tarentinus* and *Florentinus* both affirm. Moreover, if you would have any thing to bud forth very timely, *Theophrastus* saith you may procure it by setting the same

Into the Sea-onion:

for if a Fig-tree be set but neer it, it will cause the speedy ripening of Figs. And to be brief, there is nothing set in the Sea-onion, but will more easily and speedily shoot forth, by reason of the strong inward heat which that herb is endued withal. *Democritus* sheweth another means, whereby you may cause

The Fig tree to bring forth hasty Figs,

namely, by applying the same with pepper, and oyle, and Pigeons dung. *Florentinus* would have the dung and the oyle to be laid upon the Figs when they be raw and green. *Palladius* counselleth, that when the Figs begin to wax somewhat red, you should then besmeare them with the juice of a long Onion mixed with pepper and oyle; and so the Figs will be the sooner ripened. Our practice is this; when the Figs begin to wax ripe, we take a wooden needle, and anoint it over with oyle, and so thrust it through both ends of the Figs; whereby in few dayes the fruit is ripened. Others effect this, by heaping up a great many Rams horns about the root of the Tree. *Pliny* shews

How to make Coleworts branch before their time;

and this is by laying good store of Sea-grasse about it, held up with little props; or else by laying upon it black nitre, as much as you can take up with three fingers, or thereabouts; for this will hasten the ripening thereof. We may also cause

Parsley to come up before his time.

Pliny saith, that if you sprinkle hot water upon it, as it begins to grow, it will shoot up very swiftly. And *Palladius* saith, that if you pour vinegar upon it by little and little, it will grow up; or else if you cherish it with warm water as soon as ever it is sown. But the mind of man is so bold to enter into the very secret bowels of Nature, by the diligent search of experience, that it hath devised to bring forth

Parsley exceeding timely.

It grows up easily of it self; for within fifty or forty daies it is wont to appear out of the earth, as *Theophrastus* and others affirm, as by their writings may be seen. Our Country-men call it Petroselinum. In the practising of this experiment, you must shew your self a painful workman; for if you fail, or commit never so small an error herein, you will misse of your purpose. You must take Parsley seeds that are not fully one year old, & in the beginning of Summer you must dip them in the vinegar, suffering them to lie a while in some warm place; then wrap up the seeds in some small loose earth, which for this purpose you have before meddled with the ashes of burned bean-straw: there you must bedew them oftentimes with a little warm water, and cover them with some cloth, that the heat get not from them; so will they in short time appear out of the earth: then remove the cloth away, and water them still, and thereby the stalk will grow up in length, to the great admiration of the beholders. But in any case, you must be painful and very diligent; for I have assayed

assayed it; and by reason of some error and negligence, I obtained not my desire: howbeit, many of my friends having made diligent trial hereof, found it to be a very true experiment. Likewise may

Lentiles be hastened in their growth,

if they be smeared over with dry Ox-dung, a little before they are sown; but they had need lie in that dung four or five daies before they be cast into the ground. So

Melons may be hastened in their fruit;

for if in the Winter-time you lay a parcel of earth in mixens that are made of hot dung, and in the same earth sow Melon-seeds, the heat of the dung will cause them soon to sprout forth: you must keep them warm with some covering, from the snow, and the cold of the night; and afterward when the Air is more calm, you must plant them in some other place: for by this means we have hastened the fruit hereof. And by this same device of preventing their seed-time, we may cause

Cucumbers to hasten their fruit.

But *Theophrastus* setteth down another practice. Cucumber-roots, if they be carefully lookt into, will live long. Therefore if a man cut off a Cucumber close by the ground, after it hath brought forth fruit, and then cover the roots over with earth, the very same roots the year following will bring forth very timely fruit, even before others that were most seasonably sown. *Theophrastus* also sets down another way

Of hastening Cucumbers,

and that is by macerating the seed before it be sown; or else by supplying it with continual moisture after it is sown. So also we may procure

Pease or Viches to be timely ripe;

If we sow them before their ordinary season in Barley time, as *Florentinus* sheweth. But *Theophrastus* saith this may be done by macerating them in the water before seed-time, but especially if you macerate them shales and all: for there is but a little of it will turn to putrefaction; and the shale feeds the kernel well at the first, howsoever afterward it turn to nothing. The same *Theophrastus* sheweth also

How the Rape-root may be hastened in growth.

If the Gardner, saith he, do hide the same in an heap of earth, it will cause it to bring forth very timely fruit the year following. There may other fruits also be timely ripened; as

A Quince may be hastened in ripening,

if you daily bedew them with continual moisture, as *Palladius* sheweth. And *Democritus* saith, you may have

Roses growing in the month of January,

if you water the slip twice a day in the Summer-time. We may likewise procure that

Gourds shall bring forth very timely,

by underpropping and holding up their young tender sprigs. In like manner we may cause

The forward Fig-tree to hasten her fruit,

by renting or scarifying the body of the Tree, that the milky juice may there swell and find issue out of it, that when the superfluous humor is gone forth, that which is left

left behind, may be the more easily concocted, and so the fruit will be sooner ripened. To be short, we may procure

The timely ripening of all kind of fruit.

If we sow or plant them in some place where they may lie still opposite against the Sun, or if we put them into certain vessels made for the same purpose, and still water them with warm water, and let them lie continually in the Sun. And if we would have them to hasten their fruit very speedily, we should have an Oven made under those vessels, that so by reason of a double warmth, one from above, and the other from beneath the fruit may more speedily be produced. And surely this is the only cause, why fruits and flowers are more forward and sooner ripe in the Country *Pureoli*, and the Island *Inarims*, then in all other places of *Campania*, because there they hasten the concoction and ripening of them, by cherishing the roots thereof with fire and heat within the earth.

CHAP. IX.

How we may have fruits and flowers at all times of the year.

BY these ways of procuring fruit to be timely ripe, it may be effected, that we shall have fruits and flowers at all times of the year, some very forward that come before their ordinary season, and some late-ward that come after: as for their own time, then, Nature of herself affords them unto us. *Aristotle* in his Problems sheweth

How we may have Cucumbers all the year long,

both in season and out of season. When they are ripe, saith he, you must put them into a waterish ditch, neer the place where they grew, and cover it over: for by this means the heat of the Sun cannot come at them to dry them, and the waterishness of the place will keep them supple and moist, so that they will still be fresh and green. And *Theophrastus* after him saith the like; that Gourds and Cucumbers must be taken when they are small, and in their tender growth, and must be hidden in some ditch, where the Sun cannot come to waste and consume their moisture, nor the wind to dry them, which two things would mar and hinder their growth, as we see it falleth out in Trees, that are so situate, as both the winde and the Sun have their full scope upon them. If you would have

Citron trees bear fruit all the year;

to have Citrons still growing fresh upon the Tree, you must observe that manner and custom which was first peculiar in *Assyria*, but is now usual in many places. When their season is to be gathered, you must cut off some of the fruit from the Tree, and prune those parts well where you have left no fruit; but you must leave some behind, upon some other parts of the Tree: so shall you find a new supply of fresh fruit there where you cut off the former; and when these be ripe, then cut off those which you left upon the Tree before, and so fresh fruit also will come up in their stead. *Pontanus* hath set down the same experiment in verse; that part of the fruit is to be gathered, and the rest left hanging upon the Tree; for so it will come to passe, that the Tree will bud forth a fresh in those parts where it finds it self destitute of fruit, grieving as it were that one bough should be beautified with fruit, and the other should have none at all. We may also effect this by the help of engrafting: for if we desire

To have Apples all the year,

Dydimus in his *Georgicks* saith, that if we engraft an Apple into a Citron-tree, it will bring forth for the most part continual fruit. And if we would have

Arti-

Artichokes grow continually,

we may learn to do it out of *Cassianus*, who following the Authority of *Varro*, saith, that Artichokes always bring forth fruit about the same season that they are set in, and therefore it is easie to have them all the year long. The ordinary season of planting Artichokes is in November & September, and commonly they bear fruit in July and August: but they will bring forth also in March and April, if they be planted accordingly; for by that time they will have as perfect a soul, as at any time else. If you practise it three years together, to plant them in the moneths of November, December, January, February, and March, you shall have Artichokes of that kind, as will bring forth fresh fruit almost all the year long. Likewise, if you desire to have

Sperage alwayes growing fresh,

and fit to be eaten, you must take this course: as soon as you have gathered the fruit, you must dig round about the roots as they lie in their own place under the earth, and by this means they will shoot up into new stalks. In like manner, if you desire to have

Roses growing all the year long,

you must plant them in every moneth some, and by dunging them, and taking good heed unto them; you shall have fresh Roses continually. By the like practice, you may also have

Lillies all the year long;

for if you take the roots or cloves of Lillies, and set them in the ground, some fourteen, some twelve, some eight fingers deep, you shall by this means have Lillies all the year long, and so many several flowers of them as you have planted several roots. And as this may be done by Lillies, so *Anatolius* thinks the same practice will take like effect in all other flowers. *Theophrastus* saith, that we may have

Violets alwayes growing,

if we set them in well-fenced places, and such as lie open to the force of the Sun: for commonly fruits and flowers will grow there, when they will grow no where else: but they must be very carefully lookt unto, and then they will come on the better. The best way is, to set them in earthen vessels, and keep them from vehement cold and heat, bringing them forth still when the Air is calm and temperate, and applying them with moisture, and muck, and careful dressing. So we may procure also that

The Herbe Oenanthe shall flourish all the year;

for *Theophrastus* writes, that if we deal thereby, as in the procuring of Violets, we shall have flowers upon it continually.

CHAP. X.

How to produce fruits that shall be later and backward.

WE have already shewed how to produce forward fruits that will be very timely ripe; now it remaineth that we set down such cunning sleights and devices, as whereby we may procure fruit to grow very later, not to be ripe before the lowest of Winter. And this we may learn to effect by contrary causes to the former; and whereas we were to hear that which we would have to be timely ripe, we must here use coolers to make things ripen slowly; and whereas before we were to engraft later fruits into forward Trees, here we must engraft forward fruits into later Trees. Likewise we must sow or plant late, that we may receive later fruit: for as bealts

beasts that are long ere they be perfectly bred, are long before they have their hair, and do not change their hair before the same time of the year come again, in which they were brought forth; so also in plants it cometh to passe, that if they be set late, they will grow late, and bring forth backward fruits. To begin with engrafting, we will shew how thereby

To produce later Cherries.

There is a kind of Tree that brings forth a very bitter fruit, so bitter that it is called Amarendula, that is to say, a bitterling; a branch of this Tree being engrafted into a Cherry-tree, after three or four several engraftings will bring forth at length Cherries that will be very later: and howsoever the fruit of its own kind be very bitter, yet in time it will forget the former relish, and yeeld a more pleasant taste. We may effect this also by that kinde of engrafting which we spoke of in the eighth Chapter; but that will be longer in working. Likewise we may procure that

A Pear shall grow exceeding later,

if we engraft the same into a Willow; for we have declared before, that such an engrafting there may be; and certain it is, that thereby a very later fruit may be produced. But we must see that the Willow grow in such a place, as where it may be nourished with continual moisture; and this engrafting must be done about the last dayes of the Moons last quarter; and it must be grafted betwixt the Tree and the back. If any man would have

Roses grow later;

Florentinus shews how it may effected. When you have engrafted the Vine-branch into a Cherry-tree, as soon as ever the fruit cometh forth, you must set the bud of a Rose into the bark or pill thereof: for growing in another body, look what time the Tree wherein it is set, will fructifie, and at the same time will the Rose open it self, yielding a very excellent favour, and besides will be very pleasant to behold. To be short, all kinds of fruits may be made to grow later, by this kind of engrafting. Now there is another way whereby we may procure the backward growth of fruits: and this is by shaking or plucking off the buds or blossoms that grow first upon the Tree; for while new buds are growing up in the room of the first, time wears away, and yet if the Air be seasonable, these later buds will be good fruit, and well ripened, though they be slow. Thus we may produce

Figs that are very backward,

as *Columella* sheweth. When the green Figs are very small, shake them off, and the Tree will bring forth others that will not be ripe before the latter end of Winter. And *Pliny* following his authority, saith, that Figs will grow latter, if the first Green ones be shaken off when they are about the bigness of a bean; for then others will come up in their stead, which will be long a ripening. And by this means it is, that *Tarentinus* shews how to produce

Latter Grapes,

We must take away the bunches that grow first, and then others will grow up in their stead: but we must have an especiall care still to look to the Vine, that other clusters may grow, and at length be ripened. By this means likewise we may cause

Roses to open or blow very later,

if we tuck off the buds that grow first, at such time as the flower begins to appear and shew forth it self. This practise will take best effect, if it be used upon musk-roses, especially such as are wont to be fullest of leaves; for thus we have in the Country store of Roses growing all the Winter long, as they stand in earthen vessels, and are set up in Windows. So if you would have

Clowe

Clove-gill-flowers blow later;

you must tuck off the first stalks and slips about that time as they are ready to bud, and set them in the heat of the Sun all the Summer long; but you must water them continually, that they lose not all their moisture: for by this practise we have procured other stalks, and other slips which have yeelded flowers all the Winter long even to the Spring, so that we have continual Winter-gill-flowers, both at home and in the Country abroad. There is also another device whereby we may cause fruit to ripen very late; not by shaking or cutting off the buds, but by planting them late, and keeping away the cold from them. As for example, If we would

Produce later Cucumbers,

because we know that this kind of fruit cannot endure any frost, or showers, or cold storms, therefore we must sow the seeds in the Summer-time; and when the Winter draws on, we must lay heaps of muck round about them, whereby no cold may come at them to destroy them, and they may be ripened through the heat and fertility thereof. But the best way to have later Cucumbers, is, as we shewed before, either to set thereof into great Fennel stalks, or else to cast the Cucumbers into a pit for a certain season. If we would have

A Rose blow in the Winter;

we must watch the time when the tops of the sets begin to shoot up, as they grow on their beds; and then take away the sets, and plant them in another place, where the root afterward will take, & so yeeld us a winter-rose. Likewise if we desire to have

Straw-berries in the Winter or Spring,

as we have in the Summer, we must take them while they are white, before they are grown to their reddish tiew, and put them leaves and all into reeds or canes, stopping up the mouth thereof with some fat soil, and burying them in the earth till Winter come; and then if we would have them to be red of their own natural colour, let them lie a while in the Sun, and we shall obtain our purpose. By the like device as this is, we may relve

Lettice for a Winter sallet.

When she hath brought forth her leaves, that they grow up round together, you must bind the tops of them about with a little string, and keep them growing in an earthen vessel, in such a place as they may always receive fit nourishment; and by this means you shall have them still white and tender. In like manner

Endive may be kept till Winter,

to have it still fresh for any use. Others take other courses that are less chargeable; as to cover them only with earth, or with straw and leaves. Gardeners with us cover them in their Gardens with sand or such like earth, whereby they keep them very white and tender, and yet enjoy them all the Winter long.

CHAP. XI.

How we may cause fruit to grow bigger then their ordinary kinde.

IT remaineth now that we set down certain rules and wayes whereby fruit may be made greater, and far exceed the ordinary bigness of their own kind: and this may be effected divers wayes; for it may be done either by engrafting only (for indeed this is the chief privilege that engrafting hath, to procure bigger fruit); or else by planting upon those Trees which bring forth greater fruit of their own kind; or else by gathering of the fruit here and there some, if the Tree be overladen, that so the juice may more plentifully bestow it self upon the fruit that is left behind; or else by dressing and trimming them; or by other devices, as hereafter shall be shewed. We will first begin with engrafting, and shew how we may procure thereby

That Apples or other like fruit shall grow bigger then they are wont.

A tree that is planted with a graffe of her own kinde, will alwayes bring forth greater fruit, then if it were not so planted. We brought an example hereof out of *Pliny*, that *Corellius* took a Scion of a Chestnut-tree, and engrafted the same into the tree again, and thereby produced a greater and a better Chestnut. And for my own part, I have oft-times made the like proof in many other fruits, and by experience have found that all fruits may be made greater by engrafting, and careful looking unto, but especially Citrons. Secondly, we may procure fruits to be greater then ordinary, by grafting upon another Tree, whose kind is to bear bigger fruit. As for example, if we would produce

Pears that should be greater then ordinary,

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especially

especially the least sort of Pears called Myrapia, or Musk-pears, we may effect it by engraffing them into a Quince-tree; because the Quince-tree, of all other, bears the greatest fruit: and thereby the least Pears that are may be so augmented, that they will become a very goodly fruit; experience whereof, we have in many places in our Country. So we may cause

The Medlar-tree to bear huge Medlars,

greater then any man would imagine, if we engraff it into the Quince-tree: the proof whereof both I have made my self, and seen it tried by many others; and the oftener we so engraff it, the greater Medlars we shall procure. Likewise

The small Apricock may be made greater,

whereas they are the smallest kinde of Peaches that are. I have oftentimes engraffed it upon that kinde of Damofin-tree which bears a Plum like a Goats stone both in shape and greatnes, (It may be it is our Scag-tree) and by this means I procur'd great Apricocks: but if you ingraff it into any other Damofin-tree, it will yeeld but a baitard-fruit: for the Apricock doth not endure kindly, to be engraffed into any other trees besides. In our Naples and Surrentine orchards, there is excellent fruit of this kinde; and I never saw any elsewhere. We may also

augment the fruit of the Myrtle-tree.

The Pomegranate-tree and the Myrtle-tree are each delighted with others company, as *Didymus* writeth in his *Georgicks*; where he saith plainly, that the Pomegranate-tree being engraffed into the Myrtle-tree, and likewise the Myrtle-tree into the Pomegranate-tree, do each of them bring forth a greater fruit. But I am persuaded that the Myrtle-tree brings forth greater fruit in proportion to her body when it is engraffed upon the Pomegranate-tree, because the kinde of this is greater then the kinde of that, then the Pomegranate-tree doth when it is engraffed upon the Myrtle-tree. By such a kinde of means we may also procure

Mulberries greater then ordinary,

if we engraff a Mulberry into a Fig-tree: for so *Palladius* hath writen, That if the Mulberry be engraffed into a Fig-tree, the Fig-tree will cause it to change his colour, and will fill up the fruit thereof with a fat juce, so that they shall be greater Mulberries then ordinarily their kinde is wont to yeeld. A third means whereby Apples or such-like fruit may be augmented, is, by plucking off some of the fruit here and there, and leaving some few upon the trees: for so shall the juce of the tree bestow it self more liberally upon the fruit that is left, and make it greater: as a mother doth more bountifully feed one child with her milk, then she can feed twain. Wherefore if we would procure

Citrons greater then their kinde,

Florentinus counselleth us, that when the fruit beginneth to weigh down the boughs, we should pluck off here and there some, and leave but a few behinde; so shall they that are left be thicker and bigger every way. *Pontanus* also saith the same. If, saith he, you would have great Citrons, big enough to fill your hand, you must shake off a great many from all the boughs, onely leaving some few, (but you must leave both the greatest, and those also that grow in the chiefeft and likeliest parts of the tree:) for, saith he, the heir which is left, will make himself merry and fat with his brothers milk, and thrive much the better. *Palladius* shews

How to make Apples greater then ordinary,

and it is by this same means. For when they hang thick upon the boughs, you must gather away the worst, that so the nourishing juce may be converted to the best, and the fairest may thereby be the better augmented. There is yet another means whereby we may cause fruit to be the greater; and this by dressing and trimming, when we dig about them, and water them, and lay muck about them. And first, by this means

Citrons may be made greater:

for, as *Palladius* saith, they are much holpen and delighted with continual digging about them. And

Quince-pears may be augmented,

as the same Author sheweth, by watering them continually. And

Peaches may be augmented much,

if

if we plant them in moist places, and supply them with continual watering. But if you would have the Peach-trees

Bring forth very great ones,

you must watch the time when they blossom, and suckle them three days together with three pintes of Goats milk, as *Palladius* sheweth. We have practised to cause

The Pomegranate-tree to bear a mighty fruit;

and that by this means. We took a good portion of fat muck, whereunto we put an equal portion of Swines dung, and the lees of Wine and Barley-bran; and we kept all this in a dry place for a year together, every month mangling them again one with another; and at last we put Vinegar to it, and made it like an Ointment. Afterward in October and November, we digged away the earth from about some parts of the Pomegranate-tree-roots, and there wrapt in this Ointment round about them, and at length covered them again with earth; and by this Device I had greater Pomegranates then ever the tree bare before. But now if you would go forward, and practise the same upon it the two next years following, questionless you might produce very huge Pomegranates, wonderful to be seen, as big as Gourds. Likewise we have caused

Beans to bring forth great cods,

by anointing them with this same ointment, and afterward sowing them in the earth: whereby we had great increase, both for the bigness of the Bean, and also of the cod. Also

Leeks and roots of Radish may be made greater;

if we translate them out of one place, and set them in another, as *Theophrastus* sheweth. If you would have

A Rape grow bigger and rounder,

you must sow it as soon as ever it is ready to be taken out of the husk: for by the advantage and benefit of the season wherein it is sowed, it will be the more augmented; because the root will thereby be the better filled, and the larger grown. Likewise *Florentinus* sheweth, how to make

Pease of a bigger growth,

If, saith he, you take Pease, and steep them in warm water the day before you sow them, they will grow the greater. Some men take more pains then needeth; who, because they would have a greater Pease growing, they steep them shells and all, and put Nitre into the water wherein they are steeped, and sow them in their shells.

Vetches may be made bigger,

if they be set with a little pole, to grow up thereby: for this will cause them to thicken, as *Theophrastus* saith. So also

Onions may be thickned,

as *Sotion* sheweth. About some twenty days before you translate them from the place where they first grew, you must dig away the earth about them, and let them lie a drying, that all moisture may be kept from them; and then plant them again, and they will grow much bigger. But if withal you pill of the top-skin, and so plant them, they will be far greater. Likewise we may cause

Artichocks to bear a fuller fruit,

as *Varro* sheweth. If you plant them in a well-soiled place, and cover them with old dung, and water them often in the summer-time, you shall by this means have a fuller and a more tender Artichock. We may also practise another Device whereby to make greater fruit, which *Theophrastus* hath set down; and he brings an Example, how to make

Pomegranates to grow greater then ordinary:

for Art may cause the greatnes of Fruit. When the first buds be formed upon the boughs, they must be put into an earthen vessel that is made with a hole quite thorow; and the bough whereon they grow, must be swayed downward without hurting it: then cover the pot with earth, and so you shall have exceeding great Pomegranates. The reason whereof is this: The pot preserves the fruit from the vapours that would otherwise annoy it: and besides, the earth ministrerth some moisture unto it; so that the bigness thereof is increased by the store of nourishment. It receives no more help from the tree, then if it were out of the earth; and therefore the kernels are no greater then ordinary; but the pill is much thicker:

thicker : the proper juice of it is somewhat wasted and consumed ; for which cause the taste of this fruit so handled, is waterish and worse then others : but the rine receives onward nourishment, and spends none ; for which cause that is much thicker. The like practise *Palladius* and *Marzial* use, thereby to procure

A great Citron.

They take a Citron when it is young, and shut it up fast in an earthen vessel : for the Citron will increase continually, till it come to be of the bigness and fashion of the vessel wherein it is put : but there must be a hole made thorow the vessel, whereby the air may get in unto it. By the like device, *Theophrastus* afflays to produce

Cucumbers and Gourds greater then ordinary,

by hiding them while they are young, both from Sun and from Winde, that nothing may come at them to hinder their growth. Like to this Device, is the setting of them in Fennel-stalks, or in earthen Pipes ; whereby the natural Juycce and Nourishment is kept in, to the increasing of their growth. We will also shew, our of *Theophrastus*, a like Device, whereby the Herb

Alisander or Parsley may be made greater.

You must dig the Alisander round about the root, and cover it with Cachtyl, and then heap earth upon it. For the roots spend all the moisture themselves, and suffer no nourishment to ascend into the buds. This Cachtyl is hot and thick : and as by the thickness it draws nourishment to it, so by vertue of the heat it doth concoct and digest that which it hath attracted : and therefore seeing this doth both draw more nourishment to the Alisander, and also concoct it, there must needs be a greater augmentation of that herb. This practise he borrowed of *Aristotle*. This herb may also be made bigger by another means, namely, if when you plant it, you make a hole for it in the ground with a great stake : for the root will at length fill up the hole. So there is a means to make

A Radish-root grow bigger,

if it be planted in a cold ground, as *Pliny* sheweth. For Radishes are much cherish-ed and delighted with cold ; as in some cold places of Germany there be Radishes growing as big as a little child. Some have reported, that if you drive a stake into the ground six inches deep, and put chaff into the pit which the stake hath made, and then put in the Radish-seed, covering it over with earth and muck, the Radish will grow up to the bigness of the pit. By a Device not much unlike to this, *Florentinus* sheweth how to

Make great Lettise.

You must remove them, and water them well ; and when they are grown half a handfull high, you must dig round about them, that the roots may be seen : then wrap them in Ox-dung, and cover them over again, and water them still ; and when they are waxen bigger, cut the leaves cros with a sharp knife, and lay upon them a little barrel or tub that never was pitched, (for Pitch will hurt the herb) that so it may grow not in height, but onely spread forth in breadth. So the herb

Beet may be made greater,

as *Sotion* sheweth. To make Beet grow in bigness, saith he, thou must cover the roots over with some fresh Ox-dung, and divide the leaves or buds, and lay a broad stone or a tyle upon it, to cause it to spread forth in bredth. You may also make

Leeks greater,

by removing them, and laying a great stone or a broad tyle upon them : but in no case must they be watered. By the very same Device, *Anatolius* sheweth how to make

Garlick greater,

by

by laying tyles upon the roots thereof, as upon Leeks. *Theophrastus* sheweth another kinde of Device, whereby to make

Radishes greater ;

and he saith that the Gardeners of his time were wont to practise it. They took away the leaves in the Winter-time, when they flourish most, and cast the Radishes into the ground, covering them over with earth ; and so they lasted and grew till Summer came again, never shooting forth either into buds or leaves, except it were where the earth was gone, that they lay uncovered. The like Experiment doth *Palladius* teach, concerning the Rape-root, whereby to make

Rape-roots greater.

As soon as you have plucked them up, you must strip off all the leaves, and cut off the stalk about half an inch above the root : then make certain furrows for them in the ground, for every one of them a several furrow ; and there bury them asunder, about eight inches deep : and when you have cast earth upon them, tread it in ; and by that means you shall have great Rape-roots. By the like means, *Theophrastus* thinks, we may procure

The herb Wake-robbin to grow greater.

When it is most full of leaves, and when the leaves be at the broadest, we must bow them downward, winding them round about the root within the earth, that so the herb may not bud forth, but all the nourishment may be converted to the head of the herb. So may we make

Onions to grow bigger,

as *Theophrastus* supposeth, if we take away all the stalk, that the whole force of the nourishment may descend downwards ; left if it should be diffused, the chief vertue thereof should spend it self upon the feeding. *Sotion* saith, that if a man plant Onions, he must cut off both the tops and the tails thereof, that so they may grow to a greater bigness then ordinary. *Palladius* saith, that if we desire to have great-headed Onions, we must cut off all the blade, that so the juycce may be forced down to the lower parts. In like manner, if we would have

Garlick-heads greater then common,

we must take all the greenish substance thereof, before it be bladed, and turn it downward, that so it may grow into the earth. There is yet another Device, whereby to make herbs and roots grow bigger then ordinary ; but yet I like not so well of it, howsoever many ancient Writers have set it down : and first,

How to make Leeks grow greater.

Columella hath prescribed this course : you must take a great many Leek-seeds, and binde them together in thin linen clours, and so cast them into the ground, and they will yeeld large and great leeks. Which thing *Palladius* also confirms by his authority, in the very same words. But both of them had it out of *Theophrastus*, who putteth it for a general Rule, That if a man sowe many seeds bound up together in a linen cloth, it will cause both the root to be larger, and the buds to be larger also ; and therefore in his time they were wont to sow Leeks, Parsly, and other herbs after the same manner : for they are of more force when there be many seeds together, all of them concurring into one nature. Moreover, it makes not a little to the enlarging of fruits, to take the seeds which we would sow, out of some certain part of the former fruit. As for example : we shall procure

A Gourd of a greater or larger growth,

if we take the seed out of the middle of a Gourd, and set it with the top downward. This course *Columella* prescribes, in his *Horibus* : Look, saith he, where the Gourd swells most, and is of the largest compass, thence, even out of the middle there-

thereof, you must take your seed, and that will yeeld you the largest fruit. And this is experienced not in Gourds onely, but also in all other fruits: for the seeds which grow in the bowels or belly, as it were, of any fruit, are commonly most perfect, and yeeld most perfect fruit; whereas the seeds that grow in the outward parts, produce for the most part weak & unperfect fruit. Likewise the grains that are in the middle of the ear, yeeld the best corn; whereas both the highest and the lowest are not so perfect: but because Gourds yeeld great increase, therefore the experience hereof is more evidently in them then in any other. Cucumbers will be of a great growth, as the Quintiles say, if the seeds be set with their heads downward; or else if you set a vessel full of water under them in the ground, that so the roots may be drenched therein: for we have known them grow both sweeter and greater by this Device.

CHAP. XII.

How to produce fruit that shall not have any stone or kernel in it.

IT is a received thing in Philosophy, especially amongst those that have set forth unto us the choicest and nicest points of Husbandry, that if you take Quicksets, or any branches that you would plant, and get out the pith of them with some car-picker, or any like instrument made of bone, they will yeeld fruit without any stone, and without any kernel: for it is the pith that both breedeth and nourisheth the substance of the kernel. But the Arcadians are of a quite contrary opinion: for, say they, every tree that hath any pith in it at all, will live; but if all the pith be taken out of it, it will be so far from yeelding any stoneless fruit, that it cannot chuse but die, and be quite dried up. The reason is, because the pith is the moisteft and most lively part of any tree or plant: for the nourishment which the ground sends up into any plant, is conveyed especially by the pith into all the other parts: for Nature hath so ordained it, that all the parts draw their nourishment, as it were their soul and their breath, thorow the marrow or pith of the stock, as it were thorow a Squirt or Conduit-pipe. Which may appear by experience, seeing any bough or stalk, so soon as the marrow is gone, returns and crooks backward, till it be quite dried up, as the Ancients have shewed. But I for my part must needs hold both against *Theophrastus*, and against others also that have written of Husbandry, both that trees may live after their marrow is taken from them, and also that they will bring forth fruit having stones or kernels in them, though there be no pith in the trees themselves, as I have shewed more at large in my books of Husbandry. Notwithstanding, lest I should omit any thing belonging to this argument, I have thought good here to set down the examples which those Ancients have delivered in writing, that every man that lists may make trial hereof; and haply some amongst the rest using greater diligence in the proof hereof then I did, may finde better success here-in then I have found. There be many means, whereby Plants may be deprived of kernels; as namely, by engrafting, by taking out their pith, by soiling with dung, or by watering, and by other Devices. We will first begin, as our wonted manner is, with engrafting; and will shew how to produce

A Peach-apple without a stone.

Palladius saith he learned this new kinde of engrafting of a certain Spaniard, which he saith also he had experienced in a Peach-tree. Take a Willow-bough about the thickness of a mans arm; but it must be very found, and two yards long at the least: bore it thorow the middle, and carry it where a young Peach-tree grows: then strip off all the Peach-tree-sprigs all but the very top, and draw it thorow the hole of the Willow-bough: then stick both ends of the Willow into the ground, that it may stand bending like a bowe; and fill up the hole that you bored, with dirt and moss, & bind them in with thongs. About a year after, when the Peach-tree and the Willow are incorporated into each other, cut the plant beneath the joyning place, and remove it, and cover both the Willow-bough and the top of the plant also with earth;

earth; and by this means you shall procure Peaches without stones. But this must be done in moist and waterish places; and besides, the Willow must be relieved with continual watering, that so the nature of the wood may be cherished, (as it delights in moisture) and it may also minister abundant juyce to the plant that is engrafted in it. By the like experiment we may procure, as *Avicenna* shews, that

A Citron shall grow without any seed in it:

for, saith he, if we engraft it into a Quince-tree, it will yeeld such a fruit. *Alberus* promitteth to produce

A Medlar without any stones,

by engrafting it into an Apple-tree, or a Service-tree. But experience proves this to be false; yet surely, if it be so engrafted, it will have a softer kernel a great deal. The reason which brought the Ancients to think and write thus, was this: They saw that such fruits as have in them the hardest stones, do grow upon such trees as have in them the hardest pith; as the Dog-tree, the Olive-tree, the Damofin-tree, the Myrtle-tree, and the like: they saw also, that such trees as have a soft and a spongie kind of pith in them, as the Fig-tree, the Alder-tree, and such-like, bring forth fruit without any stones in them at all: and from hence they gathered and concluded, that it is the pith which nourishes the kernel. Which thing howsoever it hath some little shadow of truth in it, yet they should not have extended it generally to all plants, seeing experience proves it to fail very often. Now let us come to the second means whereby fruit may be prevented of their kernels; and this is by taking forth the pith or marrow. As for example: if you would procure the growing of

A Grape without any stone in it,

Democritus counselleth you to take a branch or twig of a Vine, and cleave it just in the middle, and either with a stone, or some instrument made of bone, fetch out all the pith, in that part which you will plant within the earth, or at least as far as you can hollow it without spoil: then presently bind up the parts together again with paper duffly and tightly wrapped about them, and make a trench for them in some moist and very fertile soil, where you must plant them in one, and fasten it to some sure prop, that it may not be wreathed nor bowed; so will they soon grow up together into one, as they were before: but it would be much better, if you would put the clove or head of a Sea-onion into that part which you have robbed of the pith: for this is as good as glue to fasten them together; and the moisture hereof will keep them supple, as also the heat hereof will cherish them much. *Theophrastus* saith, that you may procure Grapes without any stones in them, if you rob the Vine-branch of the pith that is in it, whereof the stones are wont to be gendred. And *Columella* saith, that if you would have Grapes without stones, you must cleave the Vine-branch, and take out all the pith; but so, that the buds be not hurt thereby: then joyn it together, and binde it up again, so that you crush not the buds; and so plant it in a well-soiled ground, and there water it often: and when it beginneth to shoot up into slips, you must dig deep about it oftentimes; and when it cometh to bear, it will yeeld you Grapes without any stones. *Palladius* saith, there is a goodly kinde of Grape which hath no kernels in it, so that it may be swallowed down easily, and that with no small pleasantness, as if there were many Grapes stoned and supped up together. The manner of the procuring it is, as the Greeks record, by Art assisted with Nature, on this wise: The set which we would plant, must be cleft in the middle, so far as we mean to set it within the ground; and when we have picked and clean scraped out all the pith of those parts, we must close them together again; and when we have bound them hard up, set them in the earth: but the bond wherewith they are tied up, must be made of Paper or Parchment; and the ground where they are set, must be a moist place. Some go to work more precisely, and put the plant so cleft and made up again, into a Sea-onion, so far as the plant was cleft: for by the help thereof, all plants do sooner and easier take root. *Pliny* likewise saith, there is a new-invented kinde of Grapes, when the Vine-branch that is to be planted, is

cloven

cloven in the middle, and all the pith scraped out, and the pieces knit up together again, with a special care that the buds receive no harm any way: then they let the Vine-branch in a well-soiled ground; and when it beginneth to shoot forth, they prune it, and dig often about it: the Grapes which it afterwards bears, will have no hard kernels in them, as *Columella* writes; howbeit, it is great marvel that there can be in them any kernels at all, though never so soft, seeing all the pith, which is the mother of the kernel, is quite taken away. But surely I for my part marvel at those who think it strange that a tree should live when this pith is gone, & are persuaded that a Vine-branch can bear fruit without kernels when the pith is taken out of it; seeing many men in the Country are eye-witnesses that there do many plants live without any pith in them; and seeing also it is impossible almost that any tree should bear fruit without kernels, because the kernel carries it self the very seed whereby one fruit may be generated of another. Likewise you may procure, as *Democritus* also sheweth,

Pomegranates and Cherries without any stones;

if in like manner you pick out the pith of the young plants that you set. And *Africanus* saith, If you deal with these as with Vine-branches, plucking out the pith after you have cleft them, and then plant them; and after a while cut off the upper parts of the plants when they have budded forth, then the Pomegranate set, will yield fruit without any kernels. *Palladius* borrows this same experiment of *Africanus*, and sets it down word by word as he doth. Likewise that

A Cherry-tree may bring forth fruit without any stone within;

Martial sheweth more distinctly. Cut off a young plant about two foot long, and cleave it as it stands in the ground, down to the root, and then fetch out the pith on both sides, and presently tie them up again fast, and cover the whole cleft both on the top, and on both sides, with muck; so shall they grow fast together again in one year: then engraft some young sprigs of a Cherry-tree, such as never bare any fruit before into this stock, and by this means you shall procure Cherries without any stones at all. Others, that they might accomplish their purpose more speedily, did not cleave such tender young Cherry-trees, but bored a great hole thorough Trees of good growth, so that it might pierce the whole pith, and cross it in the middle of the Tree; then they put a stake or a wedge into it, which might stop the passage of the pith, that none might be minitred into the upper parts. In like manner *Africanus* teacheth how to procure

A Peach without any stone.

You must, saith he, bore a hole beneath through the body of the Tree, and having so cut off the pith from passing upward, you must fill up the hole with a stake of Willow or Prick-wood; so shall you intercept the pith from ascending out of the root into the branches. Some Writers there are, which shew how to procure stoneless fruit by diligence in dressing and trimming of plants. It is held for a rule in Husbandry, that soft, fat, and moist nourishment doth alter all wilde and unkindly fruit into that which is milder and more natural: It is a kind of mildeness in fruits, to have a little, soft and sweet kernel; as on the contrary, it is wildeness to have a great and a hard kernel, for it cometh by reason of a kind of harsh and dry nourishment that the earth sends up into them. Wherefore no doubt but we may procure the kernel of a fruit to be smaller and more tender, by diligence and skill in dressing them. To begin with a Vine:

How a Vine may bring forth grapes without a harsh and stony kernel.

At such time as Vines are pruned, you must take a fruitful sprig, somewhat neerer the top as you can, and there, as it grows, you must pick out the pith at the highest end, never cleaving it, but hollowing it with some fit instrument as well as you can, and there uphold it with a prop that it bow not down: then take some Cyrenian juice, as the Greeks call it, and pour it into the place that is hollow; but first

you

you must steep this juice in water, to the thicknes of soddin wine: and this you must do for eight dayes together every day once, till the vine-branch sprout forth again. *Columella* saith the very same; that the vine-branch as it grows upon the Vine must be cut, and the pith of it ferched out with some fit instrument, as well as you may, out of the top without the cleaving of the branch, but the branch being whole, and still growing on the Vine, you must put into it some Benjamin or Cyrenian juice steeped in water, as was shewed before, and set it upright with a prop, that the juice may not run forth; and this is to be done for eight dayes together. So if we would procure

A Myrtle without a kernel,

Theophrastus teacheth us how to do it. If you water the Myrtle-tree with hot water, then, saith he, the fruit will be the better, and without any kernel. Some affirm, that this experiment was found out by chance: for whereas there stood neerer to a Bath, a Myrtle-tree which no man regarded, the Commers by took off some of the fruit by chance, and found them without any kernels; then they carried some home, and set them, and so this kind of fruit began first in Athens. *Diodorus* also saith, that if the Myrtle-tree be often watered with warm liquor, it will yeeld berries without any stones or kernels within. *Theophrastus* sheweth yet another way whereby this may be effected; take, saith he, the filth or shavings of skins, and put them in Urine, and so lay them about the root of the Myrtle-tree at such time as the buds begin to shew themselves, and so shall you have berries that have either none at all, or else very small kernels in them. Likewise the Pomegranate may be produced without any kernels within it, if you lay good store of Swines-dung about the root of the Pomegranate-tree.

CHAP. XIII.

How fruit may be produced without any outward rines or shells.

THe very same helps and devices which we prescribed for the producing of fruits without their inner kernel, we may likewise use in the practice of producing Nuts, & such like fruits as are wont to grow in shells and rines, that they may grow naked as it were without any shell at all. And first this may be effected by taking away the pith out of the plants that bear them so.

A Nut without a shell,

may be produced, as *Damageron* teacheth. If you bore a hole quite thorough the Nut-tree, and put into it a stake of Elm to fill it up, you shall thereby stop the pith from ascending into the upper parts, and so no shells can grow because it is the pith only that causeth them. *Palladius* counselleth you to bore the hole through the root, and stop it up with a stake of box, or some wedge made of iron, or of copper. But *Theophrastus* sheweth, how to procure

Almonds and Chest-nuts with a soft shell,

and this is by skill in dressing the Trees. If you would soften and alter the fruit, we must apply the root with Swins-dung: for this is a very forcible worker; likewise often digging will cause both the plants to prosper better, and the fruit to become better also: for the kernels will be smaller, in such fruit as have any stones in them; and such fruit as grow in shells or rines, as Almonds, and Chest-nuts, will have the softer shell without, and the larger kernel within: for the greater store of nourishment there is applied to the Tree, the moister it is, and the substance of the fruit is so much the more encreased. But *Palladius* would persuade us, that if we rid away the earth from the roots

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of

of the Almond-tree some certain daies before it begin to blossom, and all that while apply them with warm water, we shall hereby procure the Almond-shells to be very tender. If we would procure

That kinde of Nut which is called Nux Tarentina,

the same author *Damageron* hath shewed us how to do it. Every Nut and Almond will yeeld a mild fruit with a tender shell, if we continually apply the body and root of the tree with pouring ashes upon them; and likewise all other kind of fruits that grow in any shell or rine, may be so wrought upon, and will suffer the like alteration by the like means practised upon them. If you would procure a Tarentine Nut, *Palladius* saith, you must water the Tree with Lye thrice a moneth throughout a whole year, and so you may obtain your purpose. Others effect such alterations by correcting the plants; as, by cutting off the tops of the roots. If the Nut be too hard-shelled, you may also remedy it by cutting and paring off the bark of the Tree, as *Damageron* sheweth; for by this means you draw down that harsh and wilde humour: The reason whereof is, because the bark of the Tree answereth to the shell of the fruit, as the pith of the Tree answereth to the kernel of the fruit: and therefore, as to amend the inner kernel we abated the pith, so to soften or amend the utter shell or rine of the fruit, we must abate the utter bark of the Tree. A thing which we have observed by another like example: for a Peach being engrafted upon a bitter Almond-tree, the pill of the fruit thence growing was so bitter, that it could not be eaten till the pill were pared off. This secret may lead you in many other experiments of the like kind. But this kind of Nut which we now speak of, I have growing in my own Orchard, and it hath such a tender shell, and so thin, that as soon as ever it is but touched, the shell falls off, and the fruit is bare and naked. *Florentinus* assayeth to produce

An Almond without a shell,

on this manner: He break the shell very charily, so that the kernel was kept whole; then he took wool, and sometimes green leaves of the Vine or of the Plane-tree, and wrap about the kernel, lest if he should have set it without any covering about it, the Emors or such like vermine should have gnawn it. *Columella* sheweth another device whereby we may procure

A Filberd to become a Tarentine Nut.

When you have made your pit wherein you purpose to set your Nut, put into it a little earth, about half a foot deep, and there plant the seed of Fennel-gyant; and when the Fennel is come up, cleave it, and within the pith of it put your Filberd without any shell upon it, and so cover it all over with earth: this if you practise before the Calends of March, or betwixt the Nones and the Ides of March, you shall have your purpose. They prescribe likewise another device, whereby

Gourds may bring forth fruit without any seeds within them:

The Gourd, say they, will grow seedless, if you take the first branch or sprig of a Gourd when it is a little grown up, and bury it in the earth as they use to deal by Vines, so that onely the head thereof may appear; and so soon as it is grown up again, to bury it so again: but we must have a special care that the slips which grow up out of the stalk be cut away, and none but the stalk left behind; so shall the fruit that grows upon it, whether it be Gourds or Cucumbers, be destitute of all seed within. Likewise they will grow without seeds in them, if the seeds which are planted, be macerated or steeped in Sea-lamne oyle, for the space of three dayes before they be sowed.

CHAP.

CHAP. XIII.

How to procure fruits, to be of divers colours, such as are not naturally incident to their kinde.

NOW we will shew how to colour fruits: to the effecting whereof there have been divers means devised; as waterings, and engraftings which can never be sufficiently commended or spoken of, and other like practices. To begin with engrafting: If we would colour any fruit, we must engraft it upon a plant that flourishes with the same colour which we would borrow. As for example, If we would produce

Red Apples,

we must engraft them upon a Plane-tree, and the fruit will be red, as *Diophanes*, *Didymus*, and *Palladius* affirm. So we may procure that the fruit

Rhodacens shall grow red,

if we engraft it upon a Plane-tree, as *Africanus* witnesseth. Of whom *Palladius* learned that the way to make Rhodacens look red, is to engraft them into a Plane-tree. If you would have

Citrons of a red scarlet-colour,

Avicenna shews you may effect it by engrafting them into a Pomegranate-tree; for we shewed before that such an engrafting may well be made. But if you would have

Citrons to be blood-red,

Florentinus sheweth that you may effect this by engrafting them into a Mulberry-tree; which experiment *Diophanes* approveth. Likewise he that desires to have

Red Pears,

must engraft them into a Mulberry-tree; for by this means the Pears will grow red, as *Tarentinus* and *Diophanes* do witness. So also you may procure

A white Fig to become red,

by engrafting it upon a Mulberry-tree, as the same *Diophanes* witnesseth. By the same means

Apples may be of a blood-red colour,

if they be engrafted into a Mulberry-tree, as *Avicenna* sheweth. But *Beritius* and *Diophanes* write, that the Mulberry-tree it self, which makes all other Apple-fruit to become red, may be caused to bring forth

White Mulberries,

if it be engrafted into a white Poplar tree; for this will alter the colour of the fruit. But *Palladius* procures this effect by another means; not by engrafting the Mulberry into a white Poplar, but into the Fig-tree; for this also will alter their colour, and cause

White Mulberries,

as he shews in his verses; wherein he saith, that the Fig-tree doth persuade Mulberries to change their own colour and to take hers; whereof I my self have seen the experience. Likewise, of

A white Vine may be made red Wine,

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if

if we engraft a white Vine into a black: for the stock into which it is engrafted, will alter the colour much, as I have seen by experience in honey-grapes, those which we call Greek-grapes; for the Vines which have been engrafted upon those Greek-Vines, have yielded a blackish juice or wine; and the other such engrafting hath been made, the blacker juice was yielded. In the places about the Hill Vesuvius the white-wine grape, which grows upon her own stalk that is engrafted into the Greek-vine yields a more high-coloured wine than others do. Another way to make

Apples grow red,

is by diligent and cunning dressing, even by applying them with hot and fat receipts; for there are two chief Elements or principles of colours; white, and black, or dark coloured; now by dressing them, and applying fat things unto them. we may procure every flower or fruit that is blackish, to become brighter and fresher coloured; whereas on the other side, if they be neglected, that we do not bestow pains and care in trimming them, their colour will not be so lively, but degenerate into a whiterish hew; for all colours that begin to fade, wax somewhat whitish. *Beritius* therefore, endeavouring to make Apples grow red, watered them with Urine, and so obtained his purpose. But *Didymus*

To procure red Pomegranates,

watered the Tree with Bath-water ladden into Lye, and some other water mixed therewith. But there is yet another device, whereby we may procure

Apples to grow red,

by opposing them directly to the greatest force of the Sun-beams; for this will make them red. *Beritius*, that he might cause the reflex of the Sun-beams to be more forcible upon the fruit, used this sleight. He fastened certain stakes into the ground, and weighing down the boughs that had fruit upon them, he bound them charily without hurting the fruit to those stakes; and near thereunto he digged certain ditches filling them with water, or else would place some other vessels full of water near the boughs; casting this in his conjecture, that surely the heat of the Sun lighting upon the water, would cause hot vapours, which being reflected together with the heat of the Sun into the places near adjoining where the fruit hangs, and so reflected upon the fruit, would procure them to be of a reddish and a goodly colour. *Beritius* assayed to procure

Red Apples,

by another device, by a secret kind of operation. Under the Tree he was wont to set Roses, which did lend their goodly hew to the Apples that grow upon the Tree above them. *Democritus* practised the like device not upon Apples, but upon Rhodacens, and made

Red Rhodacens,

by planting Roses underneath the Tree, round about the roots. Likewise we may colour fruit by colouring the seeds of them; for look what colour we procure in the seed, either by steeping it in some coloured liquor, or by any other means, the fruit will grow to be of the same colour which the seed is, when it is set or sown. As for example, we may colour

Peaches,

with Sanguinary or Vermillion; If we bury a Peach-stone in the ground, and take it up again seven dayes after (for in that time the stone will open of it self) and then put into it some Vermillion, and bury it in the earth again, and afterward look carefully unto it, we shall thereby procure Vermillion-peaches. And *Democritus* is persuaded, that if we should put into it any other colour after the same manner, the Peach would be of that other colour. It is a thing commonly reported among us, and it is not unlike to be true, that

Peaches

Peaches may be of a sanguine-colour,

by another means. You must take a Peach-stone, and put it into a Carrot that is then growing, and the stalk which grows of that stone in the Carrot, if it be carefully nourished and preserved, will bring forth Peaches of a sanguine colour. In like manner, If you would have

White kernels growing in a Pomegranate,

Palladius sheweth how to do it, by the authority of *Martius*. If you take chalk and white clay, and with them mingle a quarter so much plastering, and apply the Pomegranate-tree roots with this kind of soilage or dunging, for the space of three whole years together, you shall obtain your purpose. Likewise, if you desire

Mellons of a Sanguine colour,

you must take Mellon-seeds, and steep them in sanguine liquor for three or four daies together before you set them, you may easily have your desire. Or else, if you open a little the skin of the seed, and put within it the juice of red Roses, Clove-gilliflowers, and Black-berries that grow upon Brambles, or of any other like things, so that it be not hurtful to the seed, you may effect your purpose. And I suppose that the sanguine-coloured Mellons which are seen in these Countreies, are thus used, that they may be of this colour. Consequent upon these devices is that sleight whereby

A Peach may grow with any writing upon it.

The Greeks affirm, that a Peach may be made to grow with a writing upon it, if you take out the stone and bury it in the earth for seven dayes; and then when it begins to open, pluck out the kernel, and write in it what you will, with Vermilion-juice: then binde up the kernel into the stone again, and set it so into the ground, and you shall have growing a written fruit. Now as the Sun doth colour the herbs that it may well come at, as we have shewed; so by keeping the force of the Sun away from them, we may whiten them; for so

A Lettice may be made white,

as *Florentinus* sheweth. If you would, saith he, procure goodly white Lettice, then must you bind together the tops of the leaves, two dayes before they be gathered; for so they will be fair and white. Likewise you may whiten them by calcing sand upon them. And with as

Artichocks are made white,

by the very same means which we speak of. And if you would cause

Beets to become whiter then ordinary,

you must cover the roots over with Cow-dung, and as we spoke before concerning Leeks, so here you must cleave the bud, and lay a broad stone or a tile upon it, as *Sotus* sheweth. So *Columella* teacheth how to make

Endive to grow white,

when the leaves are shot forth, you must tie them about the tops with a small string, and cover them over with an earthen vessel set fast into the ground, and the herb will be white. Others are at less charges, and cover them over with some earth. Our Gardeners lay them in sand, and so make them very white. If you would procure

White Sperage,

you must put the slips as soon as ever they appear out of the earth, into a broken reed; and there let them grow for a while, and afterward when you take away the cane or reed, the Sperage will be whiter then ordinary.

CHAP.

CHAP. XV.

How the colour of Flowers may also be changed.

IN transforming and meddling the colours of flowers together, we may procure such strange medleys, as nothing can be more delightful to be seen. Those which are of a deep purple colour may be meddled with azure blue; those which are as white as milk, may be meddled either with a dusky hew, or with a green, or crimson, or some other compound colours; in the beholding whereof, the minde cannot chide but be affected with great delight, and be ravished with admiration, and as it were quite overcome with the excellent beauty of them. Wherefore we will set down certain Rules, whereby we may be able to alter the colour of flowers, as we prescribed certain rules before, whereby we shewed how to alter the colour of fruits. And first we will shew, how by engrafting

Gilliflowers that are of themselves purple, or else white, may become azure blue,

You must cut off (somewhat neer the root) a stalk of Endive or Blue-bottle, or Bug-ols, but the old wilde Endive is best for this purpose, and let it be grown to an inch in thickness; then cleave that in the middle which is left growing in the ground, and plant into it a Gilliflower new pluckt up out of the earth, root and all; then bind up the stalks or slips with some slight bond, and lay good store of earth and dung round about it: so shall it yield you a flower, that is somewhat bluish, of a most delightful colour to behold. This, many of my friends will needs perfwade me, though for my own part, I have often made trial of it, and yet never could see it effected. But this I have seen, that a white Gilliflower slip being engrafted into a red Carrot made hollow for the same purpose, and so buried in the earth, hath yeilded a Sea-coloured flower. Likewise you may procure the white Gilliflower to be of a skarlet-colour, if after the same manner you engraft it into the root of Orchacet: by which means also you may turn a purple Gilliflower into a skarlet. If you would have

A Rose, as also the flower Jasmine to be of a yellow-colour,

you may procure it by engrafting either of them into a broom-stalk: for of all other, the broom-flower is most yellow: and though we cannot do it so well, by clapping the leaf or the bud of the one upon the leaf or bud of the other, yet it may be effected by boring into the stalk after this manner. You must for a Rose or a Jasmine neer to the broom, and when they are somewhat grown, take them up together with the earth that is about them; (for they will prove better when they are set again, with their own earth which is about them, being as it were their mother, then with any other earth that shall be as it were their step mother,) then bore a passage into the broom-stalk, and when you have cleared the passage, prune the rose-stalk and plant it into the broom: and there cover them with loam where the engrafting was made, and so bind it up. Afterward, when the set is grown into the stock, you must cut off all the head somewhat above the engrafting place; so shall you have a Rose or a Jasmine there growing, of a lovely yellowish colour. Which kind of flowers are very usual with us, and this their borrowed colour is so orient and bright, that the eye is scarce able to endure the brightness thereof. There is another means also whereby we may colour flowers, and that is by pouring some colouring into the roots. If you would have

Lillies to be red,

we will shew how to do it, as *Florentinus* hath shewed us. Take a Lillie-clove or head, and when you have opened it well, pour into it some Sinoper, or any other colouring, and the Lillie-flower that grows out of the clove so dressed, will be of the same colour. But you must be very careful that you hurt not the clove or head, when you so open it; and besides, you must be sure to cover it with fat and well-soiled earth. By the like means you may procure

Lillie

Lilly-flowers of a purple colour.

The manner whereof, *Anatolius* sheweth to be this. You must take ten or twelve Lilly-stalks, about such time as they be ready to yeeld flowers, bind them all together and hang them up in the smoak: then will there spring out of them some small roots, like unto a Scallion. Therefore when the time of the year serves to set them, you must steep the stalks in the Lees of red Wine, till you see they be thoroughly stained with that colour: then you must take them asunder, and set every one of them by it self, watering them still with the same Lees; and so you shall have Lillies that bear a purple flower. *Cassianus* attempted by the very like means

To produce white Ivy:

He steeped it in white Marle, and covered the roots of it with the same mortar for eight dayes together, and it brought forth white berries. We may effect the like matters by careful manuring and dressing of fruits; for if we apply them with fat and fertile muck, the flowers will be a great deal the better coloured, and may be made blackish; as we have often proved in Clove-gilliflowers, which we have procured to be so deep coloured, that they have been even black. And on the contrary

Roses, Clove-gilliflowers, and Violets will wax of a whiterish colour,

if they be not carefully lookt unto, that either you do not water them well, nor transplant them, nor dig about them, nor feed them with muck; for by this means *Theophrastus* writeth, not only these kinds of flowers, but almost all other, that grow in Woods and Forrests unregarded, do become whiterish. But *Didymus* hath devised another kind of sleight divers from these, whereby to make Roses and Clove-gilliflowers to become white very suddenly; and this is, by smoaking and perfuming them with brimstone about the time that they begin to open.

CHAP. XVI.

How fruits and Flowers may be made to yeeld a better savour then ordinary.

AS it is pretty and delightfome to see fruits and flowers wear a counterfeit colour; so it is worth our labour to procure in them a more fragrant smell, then their ordinary kind is wont to afford: which thing we may effect by divers wayes, by planting, by watering, and by other devices. And for example sake, we will first shew, how to make

Lemons to become very odoriferous.

If we take that least kind of Limons which is called *Limnecellum picciolum*, and engraft into a Citron-tree, the stock will inspire the fruit with a very goodly smell; and the oftner that you so engraft it, the sweeter smell it will afford, as by daily experience we have tried in our Naples Gardens. So also we may procure

Very odoriferous Pears,

by engrafting them upon a Quince-tree, for the stock thereof will lend the fruit a grateful savour. *Diophanes* avoucheth, that

Apples may be made more odoriferous,

if they be engrafted into a Quince-tree; and that hereby are procured those goodly Apples which the Athenians call *Melimela*. And I suppose that the Apple called *Appium malum*, was produced by the often engrafting of an Apple into a Quince-tree: for the smell of it is somewhat like a Quince; and it is not unlike that *Appium Claudius* found it out, and first procured it by the same means. Likewise we have with us great red Apples, and some of them of a murrey colour, which yeeld

yield the same smell; and questionless could never be produced but by the same means. So we have procured

The Centifole Rose to be more odoriferous.

If you would do so too, you must engraft it into that kind of Rose, which, by reason of the sweet smell of Musk that it carries with it, is called Moschatula; but you must oftentimes reiterate the engrafting of it again and again: so shall it be more beautiful, and fuller of leaves, and smell sweeter. But it is best to engraft it by Inoculation, by clapping the bud of the one upon the bud of the other; for so it will take soonest, and prove best. By a sleight not much unlike to this we may procure

Vines to smell of sweet ointments,

as *Paxanus* sheweth. If you would have the Vine to smell sweetly, and the place where it groweth, you must take the branches and cleave them, and pour in sweet ointments into them when you are about to plant them. But your labour will take the better effect, if you first steep the branches in sweet oyle, and then plant or engraft them. I have practised an easier and slighter way, besmearing the branches that are to be engrafted, with Musk, or else steeping them in Rose-water, if the Musk did not stay upon them. So also we could make

Lemons to be as odoriferous as Cinnamon,

by taking the sprigs that are to be planted, and besmearing them with oyle or the water of Cinnamon, and dressing them with much industry and diligence: And this kind of Lemons is usual amongst us, and is termed by the common-people *Limon-cellum incancellatum*. There is also another device whereby fruits may be made odoriferous, and to smell of Spices; and this is, by taking the seeds of them, and steeping them in sweet water before they be sowed. As for example: If we would procure

Odoriferous Artichocks,

Cassius hath declared out of *Varro*, the manner how to effect it. You must take Artichock-seeds, and steep them for the space of three dayes in the juice of Roses, or Lillies, or Bayes, or some other like, and so to set them in the ground. Also you may make Artichocks smell like Bayes, if you take a Bay-berry, and make a hole in it, and put therein your Artichock-seed, and so plant it. *Palladius* records out of the same Author, that if you steep Artichock-seeds for three dayes together in the oyle of Bayes, or Spikenard, or Balme-gum, or the juice of Roses, or of Mastic, and afterward set them when they are dry, that then the Artichocks that grow out of those seeds, will yeeld the smell and flavour of that which the seeds were before steeped in. *Florentinus* makes

Mellons of the fragrant smell of Roses,

after this manner, by taking Mellon-seeds, and laying them up amongst dry Roses, and so planting them one amongst another. I have procured Mellons to smell like Musk, by opening that part whereby the seed sprouts out, and steeping them in Rose-water wherein some Musk was distilled also, and so planting them after two dayes steeping. So we have procured

Odoriferous Lettice,

by taking the seed of Lettice, and putting it into the seed of a Citron, and so planting it. After the same manner, you may learn to make

Flowers grow thus shall smell of Cloves;

if you take the seeds of those flowers, and lay them in Clove-powder, or the oyle of Cloves, or Clove-water distilled, and so set them: for by this means, the flowers will entertain the smell and flavour of the Cloves. And this I take it, was the cunning

the cunning sleight whereby our ordinary Clove-gilliflowers were first produced; for questionless Gilliflowers do grow everywhere of themselves without any such pleasant smell; and besides, they are of a smaller assize, and of their own kinde somewhat wilde. But it should seem, that Gardeners did by their industry and trimming, bestow the smell of Cloves upon them, by steeping their seeds in Clove-water, or by supplying them with the oyle of Cloves, or else by tickling Cloves in the roots of them, and so planting them. We may adde to these sleights another device,

How to make Garlick grow that shall not smell rankly and unfavourily.

Sotion hath taught us the way. If, saith he, you do set Garlick, and pluck it up again, both, when the Moon is underneath the earth, it will not have any bad flavour. And *Theophrastus* hath taught us a means

How we may procure Roses to yield a more odoriferous smell,
namely, if you take Garlick, and plant it neer your Roses.

CHAP. XVII.

How to procure fruits to be sweeter and pleasanter for taste.

There are some trees, which cannot away with any scar, but if you cut their stock never so little, or make any other scar in them, presently the Air and the extrinsecal heat get in, and so the Trees perish; for the corruption will fall downward to the root, and so make the Trees presently to wither and fade away. Now there are other Trees, which will abide not only a scar, but also to have their stock cleft, and to be bored into; yea, and by this means too, they will bear fruit more plentifully, as doth the Pomegranate-tree, the Almond-tree, and the Apple-tree; of all which there is very great use. The reason hereof is this: Their nature and kinde is, to receive so much nourishment as is sufficient for them, and to void away hurtful and superfluous humours: for as those living creatures which sweat most, or have some other issue in their bodies, are most healthful and wont to live longest; so when these Trees have a cut or a scar in them whereby they sweat out, as it were, their hurtful and superfluous moisture, they do more easily digest that moisture which is left behind within them; and the better that the moisture is digested, the sweeter and pleasanter is their juice. And besides, they will live, if the parts have any continuation at all, though it be never so little, only if they may but hang together: and therefore they will easily defend themselves from any harm that may happen unto them by the cutting or mangling of any of their parts. We will shew how to procure fruits that shall be sweeter in taste then ordinarily their kind is wont to afford, first by engrafting, secondly by boring or curring, and last of all by other means. And first, by engrafting we may procure

Cherries that shall have in them the relish of Bayes,

For as we have shewed before, engrafting may amend those defects that are in plants and endue them with better qualities: so that if you have any fruit that is loathsome, because it is too sweet, do but engraft it into a bitter Tree, and there will be such a medley, that your fruit shall have a very savoury relish. *Pliny* saith, that if you engraft a Cherry upon a Bay-tree, you shall have Cherries thence growing, that will have the smack of the Bay. *Palladius* saith the same, engraft a Cherry upon a Bay-tree, and the fruit that grows thence, will have the relish of the Bay. In my time; there have been seen certain Cherries in Naples, which they called Bay-cherries, somewhat bitter, but yet pleasant withal; a most excellent kinde of fruit, far better then any other cherries, of a very large assize, full of juice, of a very sanguine colour, that have a bitter-sweet taste, so that they are neither loathsome for their overmuch sweetness, nor yet to be refused for their overmuch bitterness. So likewise may be procured

Sweeter

Sweeter Apples by engrafting them into a Quince

For if you do engraft an Apple into a Quince, the Apple will have a relish like honey: which kinde of fruit the Athenians do therefore call Melimela, because they taste like honey, as *Diophanes* sheweth. Now we will shew also, how by husbandry and skilful dressing, fruits may be made sweeter in taste; namely, by piercing or boring the stock, or scarrifying it round about, or by some other chaffisements, as the Husband-men are wont to call them; for by these means, the trees may purge themselves of their superfluous moisture, and so they will bear the sweeter fruit. As for example: If you would learn,

How to procure the Almond-tree to yield fruit without any bitterness.

Aristotle hath taught you the way. You must knock a great nail into the body of the Almond tree, that the gum of the Tree, which causeth the bitterness of the fruit, may drop out by that passage. And this is such a sleight that hereby you may tame, as it were, wilde Trees, and alter their nature into a milder kind. *Theophrastus* saith, that if you dig round about the stock of the Almond-tree, and bore thorough it about nine inches above the ground, the gum will thereby drop out, and so the fruit will become the sweeter by that chaffisement. If you cut off a bough, or an arm of it, so that the gum may have egress that way, and if you wipe away the gum still as it cometh forth, and observe this for two or three years together, you may by this means alter a bitter Almond-tree into a sweeter one. For the bitterness proceeds from no other cause, but onely from the superfluity of nourishment and moisture, which is abated by boring into the stock: and when once that which is superfluous is evacuated, then that which is left, is more easily concocted, and so the tree becomes fertile in bringing forth a sweeter and a better fruit. *Africanus* likewise affirmeth, that if you dig about the stock of a bitter Almond-tree, and make a hole into it some four inches above the root, whereby it may sweat out the superfluous moisture, it will become sweeter. *Pliny* saith the same; if you dig round about the stock, saith he, and bore thorough the lower part of it, and wipe away the humour which there issueth forth, a bitter Almond-tree will become sweeter. Some there are, who after they have made that hole, do presently put honey into it, that it may not be quite empty; for they are of opinion, that the relish of the honey is conveyed up into the fruit, through the pith, as thorough a Conduit-pipe. As for example sake; if we would procure

Sweet Citrons;

(for that kind of fruit was not wont to be eaten in *Theophrastus* time, nor in *Athenian* time, as himself reports, nor yet in *Plinies* time.) *Palladius* hath shewed, how to alter the bitter pith of a Citron-tree into sweet. His words are these. It is reported, that the bitter pithes of Citrons may be made sweet, if you take the Citron-seeds, and steep them in honey-water, or else in *Ewes* milk, (for this is better) for the space of three dayes before you set them. Some do bore a hole sloping into the body of a Tree, but not quite thorough it; by which passage the bitter humour drops away: This hole they make in it about February, and leave it so, till the fruit is fashioned; but after the fruit is fashioned, then they fill up the hole with mortar; and by this device the pith is made sweet. This hath *Pontanus* set down in his book called, *The Gardens of Hesperides*. What is it, saith he, that Art will not search into? Cut a thick Vine, and make it hollow on the top, about thy hand breadth; but so, that the brims of the hole be brought round and something close together, so that the sides be about an inch thick and no more. Pour into it and fill it up with liquefied honey, and cover it with a broad stone that the Sun may not come at it. And when the Vine hath drunk in all that, then fill it up again with the like: and when that is soaked in roo, then open the concavity wider, and let the Vine grow: but you must continually water the tender roots thereof with mans water: and you must be sure that you leave no buds or leaves upon the stock, that so there may be no other moisture let into it, but the whole Vine may grow up as it were in a spring of honey. *Palladius* shews also

How

How to make sweet Almonds of bitter ones,

even by boring a hole in the middle of the stock, and putting into it a wooden wedge besmeared over with honey.

Sweet Cucumbers

may be procured, by steeping Cucumber seeds in sweet waters, till they have drunk them up; for they being planted, will produce sweet Cucumbers. *Theophrastus* shews how to make sweet Cucumbers, even by the same sleight; by steeping their seed in milk, or else in water and honey sodden together, and so planting them. *Columella* saith, that a Cucumber will eat very tender and sweet, if you steep the seed thereof in milk before you set it. Others, because they would have the Cucumber to be the sweeter, do steep the seed thereof in honey-water. *Pliny* and *Palladius* do write the same things of the same fruit, out of the same Authors. *Cassianus* hath declared out of *Varro*, how to procure

Sweet Artichocks growing.

You must take the Artichock-seeds, and steep them in milk and honey, and after you have dried them again, then set them, and the fruit will relish of honey. So you may procure

Sweet Fennel growing,

For if you steep Fennel-seeds in sweet wine and milk, then will the fruit that grows of those seeds, be much sweeter. Or else if you put the seeds thereof in dry figs, and so plant them, the like effect will follow. So you may procure

Sweet Melons,

as *Palladius* shews; even by steeping the seeds thereof in milk and sweet wine for three dayes together: for then if you dry them, and set them being so dried, there will grow up a very sweet fruit. Likewise you may procure

Sweet Lettice;

for if you water them in the evening with new sweet wine, and let them drink for three evenings together as much of that liquor as they will soak up, it will cause sweet Lettice, as *Arifoxenus* the Cyrenian hath taught out of *Athenasus*. So

A sweet Radish may be procured,

by steeping the Radish-seeds for a day and a night in honey, or in sodden wine, as both *Palladius* and *Florentinus* have recorded. So you may procure the same, by steeping the seeds in new sweet wine, or else in the juice of Raisins. There is also another device, whereby to make sharp or bitter fruits to become sweet; and this is by art and cunning in dressing them; as, by pouring hot water, or the Lees of oile, or casting soil and such like about their roots. As for example: when we would make

A bitter Almond to become sweet,

we cast some sharp piercing matter upon the root, that by vertue of their heat, the Tree may the more easily concoct her moisture, and so yield a sweeter fruit. *Theophrastus* saith, that if we apply hot and strong soil, as Swines-dung, or such like, to the root of the bitter Almond-tree, it will become sweet: but it will be three years before the Tree be so changed, and for all that time you must use the same husbanding of it. *Africanus* saith; If you uncover the roots, and apply them still with Urine, or with Swines dung, then will the fruit be the sweeter. The *Quintilis* report of *Aristotle*, that, by covering the Almond-tree root with Swines-dung, in March, of a bitter one it becometh sweet. And *Palladius* useth the very same practice. By the same device

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Share

Sharp and sowre Pomgranate-trees may be made to bring forth a sweet Pomegranate: for these all may be changed from sharp and sowre into sweet. *Aristotle* shews in his book of plants, that Pomegranate-trees, if their roots be applied with Swins-dung, and watered with some cool sweet liquor, the fruit will be the better and the sweeter. *Theophrastus* saith, that the roots of a Pomegranate-tree must be applied with Urine, or with the offals and refuse of hides, yet not in too great a quantity: for the roots of this kind of Tree have need of some sharp matter to know upon them, and most of all, every third year, as we said before of the Almond-tree; but indeed the Pomegranate-roots are more durable. The reason is, because of a kind of softness in the roots, which is peculiar unto them alone. Now Swins-dung, saith he, or somewhat that is of the like operation, being cast upon the roots, doth sweeten the juice of the Tree: as also if you pour on good store of cold water, it will work some kind of change thereof. *Paxamus* prescribes this course, to dig round about the root of the Tree, and to lay Swins-dung upon it, and then when you have cast earth upon that, water it with mans Urine. *Columella* saith; If you have a Pomegranate-tree that bears a sharp and a sowre fruit, this is your way to amend it: You must cover the roots with Swins-dung and mans ordure, and water them with mans Urine that hath stood long in some vessel; and so it will yield you for the first years a fruit that tastes somewhat like wine, and afterward a sweet and pleasant Pomegranate. *Pliny* reporteth the very same thing out of the very same Authors. *Anatolius* shews

How to make an Apple-tree become sweeter;

and that is, by watering it continually with Urine, which is a thing very comfortable to an Apple-tree. Some do use Goats-dung and the Lees or dregs of old wine, applying them to the roots of the Apple-tree, and thereby cause it to bear a sweeter fruit. *Theophrastus* saith; If you water an Apple-tree with warm water in the Spring time, it will become better. The like applications being used to Herbs, will make them sweeter also. As for example sake; we may procure

Sweet Endive.

There be many things, which being watered with salt liquors, do forsake their bitterness, and become sweet. Of which sort Endive is one: and therefore if we would have sweet Endive, *Theophrastus* willet us, to water it with some salt liquor, or else to set it in some salt places. The like practise will procure

Sweet Coleworts.

And therefore the Egyptians do mix water and Nitre together, and sprinkle it upon Coleworts, that they may be sweet: And hence it is that the best Coleworts are they which are planted in salt grounds: for the saltness, either of the ground where it is set, or of the liquor wherewith it is watered, doth abate and take away the tartness and natural saltness of the Coleworts. In like manner, if you would procure

Sweet Betony,

Theophrastus counselleth you to water them with salt liquor, and so they will be better. Which very same things *Pliny* reporteth out of the same Author. Likewise you may procure

Sweet Rocket,

such as will yeeld leaves that shall be more toothsome, if you water it with salt liquor. There is another sleight in husbanding of Pot-herbs, whereby they may be produced fitter to be eaten; and this is by cropping the stalks of them,

Basil will grow the sweeter,

if you crop the stalk of it: for at the second springing, the stalk will be sweeter and

and pleasanter; a most evident reason whereof is assigned by *Theophrastus*. So

Lettice will be the sweeter

at the second springing. *Theophrastus* saith, that the sweetest Lettice springs up after the cropping of the first tops; for the first tops of their first springing, are full of a milky kind of juice, which is not so pleasant, because that it is not thoroughly concocted; but they which grow at the second springing, if you take them when they are young and tender, will be far sweeter. He shews also, how

Leeks may be made sweeter;

by cropping them once or twice, and afterward let them grow: the cause whereof he hath assigned in his book of causes, namely, that their first shooting up is the weakest and the most imperfect. The like is to be thought and practised in other Pot-herbs: for the cropping or cutting off, doth make the second sprouts to be the sweeter, almost in all herbs. There are also divers other sleights in husbanding and dressing of such Pot-herbs, whereby they may be made sweeter to be eaten. As for example,

Garlick may be made sweeter,

for *Sotion* is perswaded, that, if you break the Cloves of Garlick before you set them, or else supple them with the Lees of oyle, when you do set them, they will gather and yield a far sweeter relish. By another sleight far differing from this,

Onions may be made sweeter;

for we must consider, that divers things do exercise a mutual discord or agreement & concord of natures toward each other; whereby they either help one another, if their natures agree; or, if their natures dissent, they hurt and destroy one another. Nuts and Onions have a sympathy or agreement of nature; and therefore if you lay up Nuts amongst Onions, the Onions will cause the Nuts to last the longer: in lieu of which kindness, Nuts do gratifie Onions with another good turn, for they ease the Onions of their sharpness, as *Palladius* hath observed.

CHAP. XVIII.

How fruits that are in their growing, may be made to receive and resemble all figures and impressions whatsoever.

Many things do fall out by chance, and hap-hazard, as they say, which an ingenious man lighting upon, doth by his great industry, and often experiments that he makes of them, turn and apply to very good use. Whence it is that the Poet saith, manifold experience, and much labour and practice, sets a broach to the world many new arts and rare devices. And because the most part are not acquainted with the cause of such things, thence it is, that they are esteemed to be miraculous, and to come to passe besides Natures rule. We have oftentimes seen in Citrons, divers kinds of stamps and impressions, which were made there by chance; as by the hirting of some carved matter, or any stick, or such like, which hath caused the same impressions: whence, the wit of man hath deviled to cause divers kinds of fruits, to grow up with divers kinds of figures on them. If you take an earthen vessel, and put into it an apple that is very young, as it hangs upon the Tree growing, the Apple will grow to fill up his earthen case, and will be of any form whatsoever you would designe it. Also if you pown any colours and bray fire, if you make the case accordingly, and dispose of them in places convenient on the fruit, on the inside of the case, the fruits will wear and expresse the same colours, as if they were natural unto them. Whence it cometh to passe, that oftentimes the yellow Quince is made to grow like a mans head, having in it the lively resemblance of white teeth, purple cheeks, black eyes, and in all points expressing the form and colour of a mans

mans head, without any greenesse at all, which is the natural colour of that fruit whilst it is in growing. And this is the sleight that *Africanus* prescribes, whereby

A Citron may be made to grow in the likeness of a mans head, or the head of an horse, or any other living Creature.

You must take some Potters clay, or soft mortar, and fashion it to the bignesse of a Citron that is at his full growth: but you must cleave it round about with a sharp instrument, so that the fruit may be taken out of it hand[som]ly; and yet in the mean space the sides of the case must be so closely and firmly joyned together, that the fruit growing on, may not break it open. If the counterfeit or case which you make, be of wood, then you must first make it hollow within; if it be of clay, you may clap it on, as it is, so that it be somewhat dry. But then when the fruit comes to be of a greater and stronger growth, you must prepare earthen vessels made for the purpose, with a hole in them at the lower end, that the stalk of the fruit may there be let in: Into these earthen vessels you must enclose the fruit, and binde them about with a strong band, for otherwise the growth of the fruit will break them open: And when you have procured the fruit to grow up into his counterfeit, or sheath as it were, that it is come to the just bignesse of a fruit of that kinde, it will bear the same shape and figure which you would have in it. The like we have shewed before out of *Florentinus*. *Pontanus* also speaks of the same device. If, saith he, you would have a Citron to grow in divers shapes, you must cover it being young, with some counterfeit of clay, or wood, or earth, wherein it may be swaddled; as a tender infant in his Nurses bosom: and that counterfeit will fashion the fruit into any form; and when it is taken out, it will resemble any image that you have carved within the counterfeit. So also you may deal by

Pomegranates, Pears, or any kind of Apples, making them to receive any kinde of form,

for the same Author writes, that if you bestow the same pains and diligent care upon any other sort of Apples, you may frame them to every fashion; for so it is in brief, saith he, that all Apple-fruits may be made to grow up to the shape of any living creature, if you first carve the same shape into a counterfeit of wood or earth, and let the fruit be shut up into that counterfeit, that it may grow up within it. So may you make

A Quince grow in the shape of living Creatures,

as *Democritus* affirmeth, by putting them into some counterfeit that is carved within to the same proportion, and so let the Quince grow in it. But it is easiest to make

Cucumbers grow to any form;

for if you take earthen vessels of any fashion, and therewith cloath the Cucumbers when they are very young, and binde them very fast about, they will receive any shape or impression very easily. If you take a Cane, and make it hollow all along, and bind it fast about, and then put into it a young Cucumber or a young Gourd, it will grow so pliable within it, that it will fill up the whole length of the Cane. *Pliny* saith, Cucumbers grow to any fashion that you would frame them unto; inso-much that you may, if you will, make a Cucumber grow in the shape of a Dragon, winding himself many wayes. Likewise, a Gourd will be made to grow pick-ed and sharp by many means, especially if it be put into a case that is made of such pliant twigs as Vines are bound withal; so that this be done as soon as it hath cast the blossom. But if you lay a Gourd betwixt two platters, or dishes, it will grow to the same plainnesse and roundnesse; and of all other fruit, this is the easiest and fittest to be formed to any fashion. You may make them to grow like a Flagon, or like a Pear, great at the one end, and small at the other, if you tie it hard in that part which you would have to be the lesse: afterward when it is come to full growth, dry it; and take out all that is in it; and when you go abroad, carry it about you; it will

will serve for a cup to drink in. Hence we learn how it may be effected, that

An Almond should grow with an inscription in it.

Take an Almond, and steep it for two or three dayes; and then break the shell of it very charily, that the kernel receive no harm: then you must write in the kernel what you will, but write it as deep in as you safely may: then winde it up in some paper, or some linen cloth, and overlay it with mortar, and soil it with dung; and by that device, when the fruit cometh to be of full growth, it will shew you your handy work, as *Africanus* recordeth. So may you make

A Peach to grow with an inscription in it,

as *Democritus* sheweth. After you have eaten the fruit, you must steep the stone of it for two or three dayes, and then open it charily, and when you have opened it, take the kernel that is within the stone, and write upon it what you will, with a brazen pen, but you must not print it too deep, then wrap it up in paper, and so plant it; and the fruit which that will afterward bear, will shew you what was written in the kernel. But

A Fig will grow with an inscription in it,

if you carve any shape upon the bud, the fig will expresse it when it is grown: or else if you carve it into the fig when it is first fashioned: but you must do it either with a wooden pen, or a bone pen, and so your labour shall be sure to take effect. I have printed certain characters upon the rine of a Pomegranate, and of a Quince-pear, having first dipped my pen in mortar; and when the fruit came up to the just magnitude, I found in it the same impressions. Now it remains that we shew how we may

Fashion Mandrakes,

those counterfeit kind of Mandrakes, which couzeners and cony-chatchers carry about, and sell to many instead of true Mandrakes. You must get a great root of Brionie, or wilde Nep, and with a sharp instrument engrave in it a man or a woman, giving either of them their genitories: and then make holes with a puncheon into those places where the hairs are wont to grow, and put into those holes Muller, or some other such thing which may shoot out his roots like the hairs of ones head. And when you have digged a little pit for it in the ground, you must let it lie there, until such time as it shall be covered with a bark, and the roots also be shot forth.

CHAP. XIX.

How fruits may be made to be more tender, and beautiful, and goodly to the eye.

Now at length, that nothing may passe us, we will set down divers kinds of sleights in husbanding and trimming of herbs and fruits, whereby they may be made not onely tenderer, sweeter, larger, and better relished, but also fresher coloured, and more sightly to the eye. And first

How an Apple-tree and a Myrtle-tree may be bettered,

we may learn out of *Theophrastus*, who counelleth to water their roots with warm water, and promieth the bettering of the fruit by that means; nay it will cause the Myrtle fruit to be without any kernel at all. And this, saith he, was found out by chance, in certain of these Trees growing neer unto a hot Bath. If you would procure

Goodlier Figs then ordinary,

Colmella shews, how you make them to grow more plentifully, and to be a foun-
der

der fruit. When the tops of the Fig-tree begin to be green with leaves, you must cut off the tops of the boughs with an iron tool; and still as the leaves begin to bud forth, you must take red chalk, and blend it with Lees of oyle and mans dung, and therewithal cover the roots of the Tree: and by this means, the Tree will bear more store of fruit, and besides the fruit will be a fuller and better fruit. *Pliny* and *Palladius* record the same experiment out of the same Author. When the Fig-tree begins to shew her leaves; if you would have it yeeld you more and better fruit, you must cut off the very tops of them when the bud begins to shew it self; or, if not so, yet you must be sure at the least to cut off that top which groweth out of the middle of the Tree. *Palladius* writes, that some have reported, that the

Malberry-tree will bear more and better fruit,

if you bore thorough the stock of the Tree in divers places, and into every hole beat in a wedge; into some of the holes, wedges made of the Turpentine-tree, and into some of them, wedges made of the Mastick-tree. *Didymus* saith that

The Palm, or Date-tree, and the Damascen tree will grow to be of a larger and goodlier assize,

if you take the Lees of old Wine, and after you have strained them, water the roots therewith. And he saith, that it will take the better effect, if you cast upon it a little salt ever now and then. So

The Myrtle-tree will have a goodlier leaf,

and also yield a better fruit, if you plant it among Roses: for the Myrtle-tree delighteth to be comforted with the Rose, and thereby becomes more fruitful, as *Didymus* reporteth. So

Rue will grow tenderer, and more flourishing,

if it be engrafted into a Fig-tree: you must only set it into the bark somewhat neerer the root, that you may cover it with the earth, and so you shall have excellent good Rue. *Plurark* in his Symposiakes, commendeth no Rue but that only which grows very neer the Fig-tree. *Aristotle* in his Problems, demanding the cause of this, at length concludes, that there is such a sympathy and agreement betwixt the Fig-tree and the herb Rue, that Rue never grows so fast, nor flourisheth so well, as when it grows under the Fig-tree. If you would have

Artichocks grow without sharp prickles,

Varro saith, that you must take the Artichock-seed, and rub it upon a stone, till you have worn it blunt at the top. You may cause also

Lettice to grow tenderer and more spreading,

as *Palladius* sheweth, and *Columella*. *Palladius* saith, that if your Lettice be somewhat hard, by reason of some fault either in the seed, or place, or season, you must pluck it out of the earth and set it again, and thereby it will wax more tender. *Columella* sheweth, how you may make it spread broader. Take a little tile-sheard, and lay it upon the middle of the Lettice when it is a little grown up; and the burden or weight of the tile-sheard will make it spread very broad. *Pliny* saith, that it is meet also to besmear the roots with dung when they set them, and as they grow up, to rid away their own earth from them, and to fill up the place with muck. *Florentinus* saith, when you have a Lettice growing that hath been transplanted, you must rid away the earth from the root after it is grown to be a handfull long, and then besmear it with some fresh Oxe-dung, and then having cast in earth upon it again, water it; and still as the bud or leaf appears out of the earth, cut it off till it grow up stronger, and then lay upon it a tile-sheard that hath never been seasoned with any pitch, and so you shall have your purpose. By the like device you may procure

En-

Endive to be tenderer and broader,

When it is grown up to a pretty bignesse, then lay a small tile-sheard on the middle of it, and the weight of that will cause the Endive to spread broader. So also you procure

Coleworts to be more tender,

if you bedew them with salt water, as *Theophrastus* writes. The Egyptians, to make their Coleworts tender, do water them with Nitre and Water mixt together. So

Cucumbers will be tenderer,

if you steep the seeds in milk before you set them, as *Columella* reporteth. If you would have

Leeks to grow Cloven,

the Antients have taught you, that first you must sow them very thick, and so let them alone for a while; but afterward when they are grown, then cut them, and they will grow cloven. Or else, you must cut it about some two moneths after it was set, and never remove it from the own bed, but help it still with water and muck, and you shall have your purpose, as *Palladius* saith. Now we will speak of some monstrous generations; as of the generation of the herb Dragon, and of a cloven Onion. And first

How to produce the herb Dragon.

It is a received opinion amongst Gardeners, that if you take Hemp-seed or Line-seed, and engraft it into an ordinary Onion, or else into a Sea-onion as it grows neer the Sea, or else into the Radish root, thence will grow the herb Dragon, which is a notable and famous Saller-herb. But surely, howsoever they boast of it that this hath been oftentimes done, yet I have made sundry trials hereof, and still failed of my purpose. By the like setting of seeds, they shew

How to produce cloven Onions,

by making a hole into an Onion, and putting into it a clove of Garlick, and so planting it; for that will grow to be an Alcalonian, or a cloven Onion. Now let us see, how to make

Parsley to grow frizled or curled.

Theophrastus writes that Parsley will grow frizled, if you pave the ground where you have sowed it, and ram it in with a roller; for then the ground will keep it in so hard, that it must needs grow double. *Columella* saith; If you would have Parsley to bear curled leaves, you must put your Parsley-seed into a mortar, and pown it with a Willow pebble, and when you have so bruised it, wrap it up in linen clouts, and so plant it. You may effect the same also without any such labour; even by rolling a cylinder or roller over it after it is a little grown up, wheresoever or howsoever it is sowed. *Palladius* and *Pliny* record the same experiment out of the same Author. I have oftentimes seen

Basil growing with a kind of brush like hairs upon it.

The seed of withy-wiade being planted neer to Basil, as soon as it shoots up, will presently winde it self round about the stalks of the Basil, and by often winding about them, will wrap them all into one. The like will be effected also, if the withy-wiade grow elsewhere, and a twig of it be brought and planted neer to Basil: for by either of these means, the Basil will grow so bushy and so thick of hair, and that in a very short time, that it will be most pleasant to be lookt upon. So you may make the

Ivy to bear very lightly berries,

if you burn three shell-fish, especially of that kind which is called Murex, and when you have powned them together, cast the ashes thereof upon the Ivy-

R

berries;

berries; or else, if you cast upon them beaten Alooe, as *Cassianus* teacheth. *Theophrastus* mentions an experiment that is very strange, whereby to make

Cumin grow flourishingly,

and that is by cursing and banning of the seeds when you sow them; and *Pliny* reporteth the same out of *Theophrastus*: and he reporteth it likewise of *Bastie*, that it will grow more plentifully and better, if it be sowed with cursing and banning. If you desire to produce long

Cucumbers, and such as are not waterish,

you may effect it by this means. If you take a mortar or any other like vessel filled with water, and place it neer the Cucumbers, about five or six inches distant from them, the Cucumbers will reach the vessel within a day or two, and extend themselves to that length; The reason is, because Cucumbers have such a great delight in moisture: so that, if there be no water in the vessel, the Cucumbers will grow backward and crooked. To make them that they shall not be waterish; when you have digged a ditch to plant them in, you must fill it up half full with chaffe, or the twigs of a Vine, and then cover them, and fill up the pit with earth; but you must take heed you do not water them when they are planted. By all these things which have been spoken, we may learn to procure

A Tree, which of it self may yield you the fruit of all Trees.

A thing which I have seen, and in merriment have oft-times called it, the Tree of Garden-dainties. It was a goodly height and thicknes, being planted within a vessel fit for such a purpose, the mould which was about it, being very far, and moist, and fruitful, that so every way, as well by the liveliness and strength of the plant it self, as also by the moistness and chrestiness of the ground, all things that were engrafted into it, received convenient nourishment. It was three-forked; upon one bough or arm, it bare a goodly grape, without any kernels in it, pearly-coloured, very medicinal; for some of the grapes were good to procure sleep, and other some would make the belly loose. The second bough or arm, carries a Peach, a middle kind of fruit differing both from the ordinary Peach, and the Peach-nur, without any stone in it; and the smaller branches thereof bearing here a Peach, and there a Peach-nur. If at any time there were any stone in the fruit, it was commonly as sweet as an Almond; and it did resemble sometimes the face of a man, sometimes of other living creatures, and sundry other shapes. The third arm carries Cherries, without any stone, sharp, and yet sweet without, and Orenge also of the same relish. The bark of this Tree was every where beset with flowers and Roses: and the other fruits, all of them greater then ordinary, and sweeter both in taste and in smell, flourishing chiefly in the Spring-time; and they hung upon the Tree, growing even after their own natural season was past: but there was a continual succession of one fruit after another, even all the year long, by certain degrees, so that when one was ripe, there was another budding forth, the branches being never empty, but still clogged with some fruits or other; and the temperateness of the air served every turn so well, that I never beheld a more pleasant and delightful sight.

CHAP. XX.

How divers kinds of fruits, and likewise Wines may be made medicinal.

THE Ancients have been very careful and painful in seeking out, how to mix Wine with divers kinds of Antidotes or preservatives against poison, and how to use it best in such receipts, if need should be. A thing that might very well be practised; for indeed there is nothing more convenient for that purpose. And therefore they have tried and set down more curiously then need required, many things concerning this argument, strange to be reported, & yet easie to be effected;

effected; which *Theophrastus* hath copiously set down. About *Heraclia* in *Arcady*, there is a kind of wine, which makes the men that drink of it to become mad, and the women to become barren. And the like *Athenaeus* recordeth of that wine which they have in *Troas*, a place in *Greece*. And in *Thrasus* there is a kind of wine which if it be drunk, will procure sleep; and there is another kind of wine made in that sort, that it will cause a man to be watchful: and there are divers confectiōns of wines which you may read of in the most exact Writers of Physick, and of matters of Husbandry, which are easie both to be learned, and also practised by those that are well acquainted with the operations of Simples; and they are such as a mans own conjecture may well lead him unto; and indeed they are nothing else almost, but such qualities operative as the property of the place where their Simples grow, doth endue them withal. And surely I would counsel that these kinds of confectiōns should be minitred to those that are timorous and queasie in the taking of any medicinal receipts, that so they may be swallowed down pleasantly, before they should seem loathsome. And first,

How a Vine may be made to bring forth grapes that shall be medicinal against the biting of venomous beasts.

Florentinus bids you in the first and second book of his *Georgicks*, to set a Vine-branch, and to cleave it in the lower part about the root, that the cleft may be some four inches long; there you must pluck out the pith, and instead of the pith put *Hellebore* into it, and binde it fast about with some pliant twig, and so cover it with earth; and by this means it will yeeld you grapes that being eaten, will make your body soluble. Or, if you would have the grapes to be more operative in this kind, you must supple the Vine-branches in some *Antidote* or counter-poyson, and then set them in the head of a Sea-onion, and so cover them with earth; but you must still poure upon it the juice of that counter-poyson, that the sets may drink their fill of it, and so the strength and vertue of the grape will last a great deal longer. If you would have a Vine to yeild the grapes whereof the confectiōns caied *Propomata* are made, *Palladius* shews you. You must take the Vine-branches and put them in a vessel that is half full of *Hippocras*, or else of *Conserves* of *Roses*, or *Violets*, or *worm-wood*; and the earth that grows about the root, you must resolve into a kind of *Lye* as it were made of *Ashes*; then when the branch that grows up out of the bud beginneth to bear a leaf, you must take it away, & set it as you set other Vines, in any other place, and the fruit will be such a grape as you desire. *Pliny* saith, that if you plant *Hellebore* about the roots of the Vine, it will yeild a grape fit for such a purpose. *Cato* saith, that the herb *Scammony* hath a wonderful quality in drawing into it self the juice of the Vine. *Pliny* shews

How to make that kind of wine which is called Phthorium, and kills children in their mothers wombes.

That *Hellebore* which grows in *Thassus*, as also the wilde *Cucumber*, as also *Scammony*, are good to make *Phthorian* wine, which causeth abortives. But the *Scammony* or black *Hellebore* must be engrafted into the Vine. You must pierce the Vine with a wimble, and put in certain withie-boughes, whereby you may binde up unto the Vine the other plants that are engrafted into it: so shall you have a grape full of sundry vertues. So you may procure

Figs that shall be purgative,

if you pown *Hellebore* and *Sea-Lettice* together, and cast them upon the Fig-tree roots: or else if you engraft them into the same roots, for so you shall have Figs that will make the belly loose. *Florentinus* saith, that you may make a Fig to grow which shall be good against the biting of venomous beasts, if you set it after it hath been laid in triacle. So we may procure

Purgative Cucumbers.

You must take the roots of the wilde Cucumber, and pown them, and steep them in fair water two or three dayes; and then water your Cucumbers with that liquor for five dayes together; and do all this five severall times. Again, you may make them purgative, if, after they are blossomed, you dig round about their roots, and cast some Hellebore upon them and their branches, and cover them over with earth again. So you may procure

Purgative Gourds,

if you steep the seeds of them in Scammony-water nine dayes before you set them, as the Quiniques report. Now if you would procure a man to be loose bellied and sleepe withal, you may cause

Purgative Damofins that be good also to cause sleep.

You must bore thorough a bough, or through the whole stock of a Damofin-tree, and fill it up with Scammony or the juice of black Poppy wrapt up handfomely in paper, or some such covering: and when the fruit is ripe, it will be operative both for sleep and purgation. *Cato* shews also, how you may cause

A Vine to be purgative.

After the Vintage, at such time as the earth is used to be rid away from the roots of Vines, you must uncover the roots of so many Vines as in your opinion will make wine enough to serve your turn: mark them, and lop them round about, and prune them well. Then pown some Hellebore roots in a mortar, and cast them about your Vines, and put unto them some old rotten dung and old ashes, and twice so much earth amongst them, and then cover the Vine-roots with mould, and gather the grapes by themselves. If you would keep the juice of the grape long that it may last you a great while for that purpose, you must take heed, that the juice of no other grapes do come neer it. When you would use it, take a cup full of it, and blend it with water, and drink it before supper, and it will work with you very mildly without any danger at all. Late Writers have taken another course: they rid and cleanse the Vine-roots, and then poure upon the juice of some purgative medicine to water them withal; and this they do for many dayes together, but especially at such time as the bud beginneth to fill out: when they have so done, they cast earth upon the roots again, and they take special regard, that the roots never lie naked and open when the Northern winde bloweth; for that would draw forth and consume the juice of the medicine that is poured upon the roots. This if you diligently perform, you shall have grapes growing upon your Vines, that are very operative for loosing of the belly. I have effected

The same by another means;

I pierced the Vine with a wimble, even unto the very marrow, and put into it certain ointments fit for such an effect: (it will suffice, if you put them within the rind,) and this I did in divers parts of the Vine, here and there about the whole body of the Vine, and that about grafting time by Inoculation; for then the Vine is full of moisture; whereby it cometh to pass, that the moisture it self ascending at that time into the superior parts, doth carry up with it the vertue of the ointments, and conveys it into the fruit, so that the fruit will be operative either for purgation or for childe-bearing, either to hurt or help, either to kill or preserve, according as the nature and quality of the ointment is, which was poured upon the roots of the Vine.

CHAP. XXI.

How to plant Fruits and Vines, that they may yield greatest encrease.

THAT we may conclude this whole book, with a notable and much desired experiment, we will now shew in the last place, how we may receive a large encrease

crease from the fruits, and pulse, and Vines which we have planted. A matter surely that must needs be exceeding profitable, for a man to receive an hundred bushels in unity as it were, for one bushel that he hath sowed. Which yet I would not have to be so understood, as if a man should still expect to receive an hundred for one, precisely or exactly so much; for sometimes the year, or the air and weather, or else the ground, or else the plants may not perform their parts kindly; and in this case, the encrease cannot be so great; (but yet it shall never be so little, but that it shall be five times more then ordinary;) but if those things do perform their parts kindly together, you shall receive sometimes for one bushel, an hundred and fifty by encrease. This may seem a paradox to some, and they will think that we promise impossibilities; but surely if they would consider all things rightly, they should rather think it a paradox, why half a bushel well sown or planted, should not yield two hundred bushels encrease, seeing that one grain or kernel that is planted and takes kindly, doth oft-times spread his root, as we see, and fructifie into hundre and many items, sometimes into fifteen, and in the ear of every one of those stalks, are contained sometimes threecore grains? I spare to mention here the ground that lies in Byzantium in Africa, whereof *Pliny* speaks, which, for one grain that was planted in it, did yield very neer four hundred stalks, and the Governour of that Country sent unto *Nero* three hundred and fourty items growing out of one grain. But let us search out the cause whereby this comes to pass. Some think that the encrease commonly falls out to be so little, because the greater part of the fruit which is cast into the ground, is eaten up of worms, or birds, or moles, and of other creatures that live in the earth. But this appears to be false, because one bushel of Pulse being planted, never yields above fifteen. Now the Pulse or Lupines, is of it self so bitter, that none of those devouring creatures will taste of it, but let it lie safe and untouched: and when they are grown up, you shall commonly finde about an hundred grains in the cods of every stalk. Others referre the cause hereof unto the weather, as if the fruit were annoyed with over much cold, or heat, or rain, so that the fields are sometimes frozen with cold, and sometimes parched with heat, whereby they are sometimes more fruitful, and sometimes more barren. But this cannot be the true reason, because that though the weather be never so kindly, yet that cannot make one encrease into thirty. But not to wander or range any further about, we must know that all grains that grow within the ear or the husk, are not prolificall, that is, they are not all fit to yield encrease; for God hath appointed some of them for the food and sustenance of living creatures, and others for seed. There are some grains in an ear, which are as it were abortives, such as degenerate from their natural kind, and will not fructifie at all, but rot and waste away into putrefaction. There are other grains in an ear, such as are easier to be stript out of their husk, which are fitter for propagation, and are better enabled by nature thereunto. Besides that, sometimes it falls out, that seeds or grains are not planted in due season; or if they be, yet sometimes the Husbandman doth not bestow that due labour and industry in looking unto them, which the kind of the fruit requires. Wherefore if we can meet with all these impediments, we may procure encrease according to our hearts desire. For the seeds will be larger in the roots, and when they have spread their roots under the earth of a good length, then will they send up a greater number of stems, and bring forth good store of ears. Therefore you must make choice of your seeds or grains, not of the forwardest, nor yet of the backwardest, because they commonly are weakest, but of the middle sort: then wash them and cleanse them from all other seeds; and besmeare them with fat ointments, and with the grease of old Goats; and let them be continually supplied with sufficient heat, and sufficient moisture; then lay them in soft and warm mould carefully manured; for the livelier that the heat of the mould is, the better will the seeds close with it, and become more eager to propagation, and embrace it more sweetly, as the male would do by his female. So shall your seeds be more enlived, and bring forth a more legitimate and a larger encrease. Let them be planted in the

the full of the Moon or thereabout; for the larger the Moon is, the more bountiful encrease she will procure. Concerning the Vine, you must see that her leaves be not wanting, if you would have good store of Wine; for, if the leaves be away, the Vine hath little heart to bear; and besides, she should be without an issue for her superfluities, which commonly the leaves do receive into themselves: only you must pare off those twisted curls that are wont to grow upon it; for so, her pride being taken away from her, the juice will be more delightful, and more pleasant.



THE



THE FOURTH BOOK OF Natural Magick:

Which teacheth things belonging to House-keeping;
how to prepare domestical necessities with a small cost;
and how to keep them when they are procured.

The P R O E M E.

From Animals and Plants, we are come to Household-affairs; there we provided diversity of new fruits fit for our use: now we shall seem to have sowed nothing, and produced nothing, unless we shew how, & what we sowed and produced at great charge and pains, may be preserved against the cold, and injuries of the outward air, that they may come forth in their seasons. It were the part of a wicked and slothful man carelessly to let that dye and come to nothing, which he had provided with so much care and pains: wherefore as you were witty to produce them, you must be as diligent to preserve them. And the Husband-man that stores up fruit, shall have good provision for the Winter. For saith Marcus Varro, they serve for several meats, and no man stores them up but to produce them when he hath need of them, to defend, or use, or sell them. I shall first set down the inventions of our Ancestors, who were very diligent herein, for they found sundry things by divers means, and faithfully delivered the knowledge of them to posterity. Then I shall relate what I know to be true, intermixing some of my own inventions, and such as I think to be of greatest concernment, and that I have often tried. I shall besides add some considerations of bread, wine, and oyle, and such as are of great profit for the Husband-man to provide for his family with the lesser cost, alwayes setting down the natural causes; that they being perfectly known, a man may easily invent and make them. But to proceed to the work.

CHAP. I.

How Fruits may be long preserved upon their Trees.



WE will begin with Fruits: And whereas fruits and flowers both may be preserved either upon their own mother Tree which bear them, or else being plucked off from it, we will first shew, how fruits may be preserved upon their own Tree, and first rehearse those things which the Ancients have set down concerning this matter, and next, what we our selves have found out by our own experience. Our Ancestors, when they would have fruit to last long upon the Tree, were wont first of all to bind them to the stock or to the boughs, lest any tempest should strike them off, or toss them up and down. Besides, they did intercept that juice from them, which should ripen them: for there are some kinds of fruits, which, as soon as ever they be ripe, will stay no longer upon the Tree, but fall down of themselves, though they are not so much as shaken: other fruits there are that will stick longer and faster to their hold. Besides, they were wont to cover them with certain cases or shells as it were; thereby guarding them from the injuries of the weather, both hot and cold, and also from the mouths of devouring birds. Wherefore to make

Pome'

Pomegranates hang long upon their Trees;

Some have wreathed and platted about the fruit the smaller boughs that grow hard by, that the rain may not come forcibly upon it to break it or chopt it, for if it be once bruised, or that it do but gape and have any chops in it, it will soon perish: and when they have so done, they tie them fast to the stronger boughs, that they may not be shaken; and then they bind the Tree about with a kind of broom withes, that the Daws, or Crows, or other birds may not come at the fruit to gnaw it. Some do frame earthen cases fit for the fruit, and cover the same with strawe mortar, and let the fruit hang still upon the Tree in them. Others do wrap up every one of the Pomegranates in hay or holm, and then daube it thick over with mortar which hath chopt straw in it, and so fasten them to the stronger boughs, that the winde may not shake them. But all these practises must be used when the weather is fair, and there is neither rain nor dew stirring, as *Columella* teacheth. But *Beritius* useth this means to make them stay long on their Tree. He takes the blossoms of the Tree when they begin to wither, and wraps in them every Pomegranate by it self, and then binds them about with bonds; thereby preventing their putrefaction, and their chawns and chops which otherwise would be in them. Others put them in earthen pots every one by it self, and cover them well, and fetter them fast, that they may not be broken by knocking against the stock or arms of the Tree, nor by hitting one against the other: for by this means you shall have them alwayes better grown then by any other. *Varro* saith, that if you take Pomegranates before they be ripe, as they lye upon their stalks, and put them into a bottomless pot, and cover them, boughs and all, in the ground, so that no winde may come at them, you shall not only finde them whole when you take them out, but they will be greater also then if they had hung still upon the Tree. *Palladius* shewes,

Citrons may be preserved upon the Tree;

even by shutting them up in certain earthen vessels fit for such a purpose; for so you may keep them upon their Tree almost all the year long. If you would have

Grapes hang upon the Vine, fresh and good, even till the Spring of the year,

Beritius prescribes you this course. You must dig a pit in a very shadowy place near to the Vines, about a yard deep, and fill it up with sand, and set up some props in it: then you must loosen the joints of the Vine-branches, and winde them in together with the clusters of grapes to be tied to the props, and then cover them, that no water may come at them. You must take heed also that the grapes do not touch the ground. A thing which I have oft-times put in practise, but it fell not out to my expectation: for still the grapes were half rotten, and their colour quite faded. *Columella* saith, There is no surer way then to prepare certain earthen vessels which may hold each of them a cluster of grapes, so that they may have scope enough; and they must have every one four handles, whereby they may be tied to the Vine, and their lids or coverings must be so framed that the middle may be the place of closing, where both sides of the cover may fall close together when the clusters are in, and so meeting may hide the grapes. But you must see that both the vessels themselves, and also their coverings be well pitched both within and without; for the pitch will do good service herein. When you have thus covered and shut up your grapes, then you must lay good store of mortar with straw chopt in it upon the vessels. But in any case, look that the grapes be so placed in the vessels, that they touch no part thereof. *Tarentinus* gives this counsel. The clusters that first grow, you must pluck off, and then others will come up in their steads, if you look carefully to the Vine: now these later clusters will be very backward and long ere they be ripe: take some earthen vessels, and let them be somewhat open below; put into them your later clusters, and let the upper part of them be very close covered, and then bind your vessels fast unto the Vine, that so the wind may not shake them. *Palladius* saith; If you be desirous to keep grapes upon the Vine till the

the Spring-time, you must take this course. Neer unto a Vine that is laden with grapes, you must make a ditch about three foot deep and two foot broad in a very shadowy place; and when you have cast sand into it, stick up certain props, and winde the bunches daily towards them, and when you have wrought them to stand that way, bind them to your props without hurting the grapes, and then cover them to keep them from the rain. The Grecians likewise counsel you to shut up your grapes into certain earthen vessels which are somewhat open beneath, but very close and fast shut above, and so you may preserve them long upon the Tree. If you would preserve

Grapes upon the Vine till new come again, so that upon one and the same Vine-branch, may be seen old and new grapes both together,

you may effect it by this device, which I my self have used: for, all the former experiments are the inventions of Antiquity, and because there is great difficulty in working them, and small profit when they are wrought, therefore I esteem them as toys and matters of little worth. But this I have experienced my self, and preserved good grapes upon a Vine until May and June, and so have seen both new grapes, and grapes also of the former year together upon one and the same branch. When Vintage time is past, you must take the tops and pliant twigs of such Vines as grow by the house side, and winde them in at the window into the house, and binde them fast to the summers or beams with the sprigs of Broom, as with stirrings or thongs, that they may be surely stayed from wagging up and down: but you must let them in handiely that the windows may be opened and shut conveniently. By this means you shall keep them safe from the injury both of the cold weather, and also of the devouring birds. When there is any frosts or winds abroad, keep the windows close shut, and open them again when the air is waxed anything calm and warm; and so deal by them till the Spring come. And when the Vine begins to bear new buds and new leaves, then let your twigs out of prison, and bring them back again into the open air, and there let them take the comfort of the warm Sun. So shall there grow new grapes upon the same twigs where the old grapes are. I have also effected the same

By another means.

Because it was a great trouble, and a very irksome piece of work, to take that course every year, I have thought of another device whereby the same effect may be attained both more prettily and miraculously. About the time wherein they are wont to prune Vines, make choice of two special branches upon the Vine, such as are most likely to bear fruit. Cut off the tops of either of them, but leave the branches still growing upon the Vine, and leave two or three buds upon either branch. Then take a vessel made of chalk or white clay, and let there be a hole bored quite thorough the bottom of it, and so place it, that it may stand fit for the branches to be drawn thorough it, so that they may stand a little out above the brims thereof. When your branches are so seated, then fill up the vessel with earth; and, that you may work more surely and speedily too, you must set over your earthen vessel another vessel full of water, all the Summer long, which must be tye toward the bottom with a clout somewhat loosely, that the clouts end hanging down into the earthen vessel, may bedew the earth that is in it continually by little and little; so shall your sprigs or branches bring forth both fruit and leaves, and moreover shall take root within the vessel that will shoot out into new twigs. After Vintage-time, cut off the branches from the Vine a little beneath the earthen vessel, and so carry them into a close house that is situate in a dry place where no tempests can come at it, as in Wine-cellars, or such like: Let the windows be netted over, that the birds may not come at them: In the Winter-time, if there come any fair dayes, bring them forth into the Sun; and, when the weather is extrem cold, keep them in so much the closer and warmer rooms. If you preserve them thus until August, you shall have old and new grapes both together upon one branch, and each of them will be quick and well-coloured.

CHAP. II.

How Flowers may be preserved upon their own stalk.

By the like devices as those were, we may also preserve flowers upon their own stalk; yet not so easily as fruits may be preserved upon their own Trees: Neither yet can they be made to last so long as fruits, because fruits are of an harder substance, but flowers are soft and tender. First therefore we will shew

How Roses may be preserved upon their own stalks.

If you take a Reed or Cane, and cleave it when it is green as it grows by the Roses, and put in the Rose-bud as it is upon the stalk, within the Reed, and then binde some paper about the Reed somewhat loosely, that it may have as it were a breathing place; your Roses will thereby be well preserved upon their stalk, as *Dydimus* reporteth. *Palladius* saith; If you shut up your Rose-buds as they grow upon their stalk, into a growing Reed which you have cleft for that purpose, and close up the Reed again, that the cleft do not gape, you shall have fresh Roses when you will, if you open your Reed again. I have tried this device, and found it in some sort to be true, and answerable to my intendment: I took the Rose-buds before they were blown, and shut them up into a Reed (for the Roses and the Reeds must be planted neer together) and the cleft which I had made in the Reed, being but slender, I bound it up again that it might not stand gaping, (onely I left a fit passage for the Rose stalk to stand in) and so I preserved them a great while. The like device I used

To preserve Lillies upon their stalks for a long time.

I cleft the Cane betwixt the joints, and put the Lillies into it as they grow upon their stalk before they were blown, and so the joint of the Cane closing upon them beneath, and the cleft above being stoppt with wax, the Lillies were thereby long preserved upon their stalk. The very same experiment I practised upon Clove-gilliflowers, and so I had them growing upon their stalk a great while: And whensoever I would use them, I brake up their cases wherein they were preserved, and so by the comfort and force of the Sun, they were blown and opened themselves.

CHAP. III.

How to make Fruit safes, or places wherein fruits may conveniently be preserved.

Now we will shew how you may preserve fruits when they are taken off from the Trees whereon they grow. Wherein because our chiefest care and labour is, to keep them from putrefaction, therefore, that we may so do, we must first know the causes of their putrefaction. The Philosophers hold, that the temperature of the air being of it self exceeding variable by reason of the variety of celestial influences which work upon it, is also of that force, that it causeth every thing which it cometh at, even whatsoever is contained under the cope of the Moon, to hasten towards an end, and by little and little to decay continually. For the air which is apt to search every thing when it lights upon any fruit, finds in it a certain natural heat somewhat like to its own heat; and presently closes with it, and entices as it were the heat of the fruit to come into the air: and the fruit it self, having a natural coldness as well as heat, is very well content to entertain the heat of the circumstant air, which exhausteth the own heat of the fruit, and devoureth the moisture of it, and so the fruit shrinks, and withereth, and consumes away. But man is not of such a dull sense, and of such a blockish wit, but that he can tell how to prevent these inconveniences, and to devise sundry kinds of means, whereby the soundnesse of Fruits may be maintained against the harms and dangers both of cold, and of heat. And first we will speak

of Fruit-safes, or artificial places, whereby the danger of heat may be avoided. Then we will shew that there is especial choice to be made of times, wherein heat shall be of small force. And then we will prescribe the manner of gathering fruits, lest happily they might be bruised with handling or falling, which if they should, it would be their bane, and the beginning of their putrefaction. And last of all, we will teach you how to lay them up in divers and lundry places, whereby you may prevent the heat and moisture of the air, from doing them any harm. First therefore, that we may prepare cold and dry places, wherein we may lay up such fruits as we would have to last long, and so to keep away the extrinsecal heat and moisture, we must understand that there are places, some general, and some particular. We will speak of some peculiar places of the world, which are excellent good to preserve fruits in. *Theophrastus* saith, that some fruits will last the longer, because they are laid up in some certain places. Wherefore, in a certain place of Cappadocia, which is called Petra, fruits may be preserved forty years, and yet they are all that time fertile, and very fit to be sown: nay, saith he, if they be kept threescore years, or threescore and ten, they will still be very good for meat to be eaten, though not so good for seed to be sown. The place he reports to be a high place, and open for the winds, and to stand lower towards the North then to the other three quarters of the world. It is reported likewise, that fruits are preserved in Media, and other high Countries, longer and better then in other places. But these are the properties of some peculiar places onely. But generally for all Fruit-safes, it is the judgement and counsel of all the best and learnedst Husbandmen, that they must be so situate, that they may have windows towards the North, which must lye open in the Spring-time, and every fair day, that the Northern wind may blow into them. But in any case there must no windows be made towards the South, because the Southern wind will make your fruit full of wrinkles. Let us see therefore

What places are fittest to lay up Quinces in.

Marcus Varro saith, that they will be preserved well if they be laid up in some place that is cold and dry. *Columella* also layes them up in a cold floor or loft where there cometh no moisture. *Palladius* likewise would have them laid up in some cold and dry place, where there cometh no winde. So if you would

preserve Apples well,

Columella teaches you to lay them up in a very cold and a very dry loft, where neither smok, nor any noisome savour can come at them. *Palladius* would have them laid up in some close and dark places, where the winde cannot come at them. And *Pliny* would have them laid very thin one by another, that so the air may come equally at every side of them. So

Pomegranates may be preserved,

as *Columella* reporteth out of *Mago* the Carthaginian, if first you warm them in Seawater, and then besmeare them with some chalk, and when they be dry, hang them up in some cold place. And *Palladius* out of *Columella*, prescribes the very same course. In like manner you may

Preserve the fruit called Ziziphum,

if you hang them up in a dry place, as the same Author is of opinion. If you would have

Figs to last a great while,

Columella teacheth you, that as soon as they be thoroughly dry, you must lay them up in a very dry room, and thereby you shall preserve them for a long time. So

Damons may be long preserved,

If you lay them upon hurdles or grates in some dry place, where the Sun may come at them. *Palladius* shews, that

Chest-nuts may be long preserved,

If they be raked up in the earth, where they may lie dry. And I my self have seen in Barry,

Almonds preserved sound a great while,

three years or four years together, shells and all, being laid up in a dry place. If you would have

Wheat long preserved;

Varro saith, that you must lay it up in high Garners which have a thorough air on the East-side and on the North-side: But in any case, there must no moist air come at them from any waterish places thereabouts. Some have their Garners under the ground, as Caves, as it is in Cappadocia and Thracia; others have their Garners in pits and ditches, as it is in the neerer part of Spain: only they lay the chaffe under it, and take special care that no moisture nor air may come at it, except it be when they take it out to use some of it: for if the air be kept from it, the worm cannot breed in it to devour it. By this means they keep their wheat good and sweet, fifty years; and they preserve their Millet above an hundred years, as *Theophrastus* recorderh. If you lay up your wheat with any dust in it, it will putrifie: for the extrinsecal heat of the dust, doth as it were lay siege to the natural heat of the grain, and so choaks it up, because it hath not as it were a breathing place; and by this means it is over-heated, and so putrifies. *Florentinus* reporteth, out of *Varro*, that Corn may be very well preserved above ground, if it be laid up in such places, as have the Eastern light shining into them: they must also be so situate that the Northern and the Western winds may come at them moderately; but they must be safe from all Southerly winds: and you must make in them a great many of channels, whereby both the warm vapours may have issue forth, and also the cooling air may have access in. The best way whereby you may

Preserve Beans;

is, to parch them reasonably well; for so there will be less store of moisture in them, which will cause them to last the longer. *Theophrastus* writes, that in Apollonia and Tarentum, they preserve Beans long without any parching at all. *Pliny* makes mention of certain Beans that were laid up in a certain Cave in Ambracia, which lasted from the time of King *Pyrrhus*, until the war which *Pompey* the great waged against the Pirates. The same *Theophrastus* writes also, that

Pease may be long preserved,

if you lay them up in high places where the wind hath his full force, as in Media and the like Countreies: but the Bean will be kept there much longer. So also the

Pulse called Lupines, may be long preserved,

if you lay them up in a loft where the smoak may come at them, as *Columella* writeth: for if any moisture do settle upon them, presently the worm breeds in them; and if once the worm have eaten out the navel as it were of the Pulse, that which is in them like a little mouth, then cannot the other part which is left, be ever fit for seed. *Palladius* likewise saith, that this kind of Pulse will last very long, if it be laid up in dry Garners, where no moisture can come at it; especially if it may be continually perfumed as it were with smoak. But now let us shew how to do that which is the most difficult thing of all in this kind, namely,

How to preserve flesh and fish,

I have seen flesh and fish preserved from putrefaction, for a whole month together

ther in very cold places, without any other art at all besides the coldness of the place. In rooms that are made under the ground, and very cold, where there cometh neither heat nor any Southerly winde, but that they are continually cold and dry, almost every thing may be preserved without putrefaction. In a certain monastery that is upon the Hill *Parthenus*, neer unto Naples, I saw the carcases of men kept whole and sound for many years together. The Hill is covered over with snow almost continually: and in the tops of the Mountains, where the snow lies in ditches and pits, conveyed thither of purpose to keep it, look what Pears, and Cervises, and Apples, and wilde Chest-nuts have been gathered up by chance together with the snow, and put into the same pits; after the space of a year that the snow was consumed away, we have there found the same fruits, so moist, and fresh, and goodly to the eye, as if they had been but then pluckt off from their Trees. To conclude, there is nothing better and more available for the preservation of any thing, then is the dryness and the coldness of such places as they are laid up in, to be kept.

CHAP. IV.

What special time there must be observed for the gathering of such fruits, as you mean to lay up in store for a great while after.

THe principal matter which I would have to be observed in this case, is the choosing of your time wherein to gather all such fruits as you would lay up in store, that they might last long. For if we desire to defeat that heat and moisture which will mar our fruit, and cause it to putrifie, we cannot take any better counsell against them, then by making choice of such a time to gather our fruits in, as when those planets and stars, which are the principal Authors of that heat & moisture, are themselves become cold and dry, or at the least not hot and moist in any high degree. The Moon when she is in the waining, is cold and dry: If there be any fruits gathered when the Moon aboundeth with heat and moisture, the very same qualities will also the fruit abound withal, and so they will very soon be putrified, as every man of any wit will easily judge: and therefore all those that have written of Husbandry, with one consent do give it for a precept, that fruits are to be gathered in the decaying of the Moon. Moreover, the night and the day, the morning and the evening, do bestow their moisture and their dryness upon fruits, accordingly as they themselves are either moist or dry. The day, by reason of the presence of the Sun, is hot and dry. The night, by reason of the absence of the Sun, is cold and moist: The evening, by reason that it hath a little of the Sun, is partly warm; and yet withal by reason of the approaching night, is partly moist: The morning, is partly cold, by reason of the tail of the night; and partly warm, by reason of the Sun approaching: So then, let two or three hours of the day be spent, and then the time will be somewhat dry, because it hath begun to be a little acquainted with the Sun; and withal somewhat cold, because it hath not yet quite forgotten and shaken off the night; and this is in all mens judgement the best and the fittest time wherein to gather fruits. But lest we should make the matter too hard and difficult, by giving such Astrological precepts, we will frame our selves to the plainest, and yet a very exact rule; namely, that the situation and aspect of the Planets is to be regarded, whereby the air becometh colder and dryer then at other times, and so consequently the fruit may last the longer. And, because we will not be too tedious, we will spare to alledge authorities and experiments which might be brought for the proof hereof, seeing all living creatures that are gendered in the full of the Moon, or somewhat before, do grow much more then they that are gendered when she is in the waining. But let us come to examples. If you would know

The time, wherein Citrons are to be gathered,

Palladius teaches you in his book of the preserving of Citrons. If you would gather Citrons to keep, saith he, you must pluck them with their boughs and leaves from the

the Tree in the night time, when there is no Moon-light Rising. *Pontanus* a Country-man of ours hath elegantly set down this matter. If you desire, saith he, to keep Cuttings long without any harm or loss of their vigor, you must take this course: Pluck off the fruit together with the branches & leaves as they were upon the Tree, in the night time when the Moon shines not at all: Then hang them up upon some hook or rack in some dark and close place; see that you touch them but very softly, and let not any winde come at them; or else lay them up amongst chaffe and dry straw; So shall you keep the fruit sound and good, and the leaves also green for a great while together. There is also

An appointed time wherein Quince-pears are to be gathered.

I have found no better or surer way to preserve Quince-pears, saith *Columella*, then by gathering them that were very ripe and sound, and without any blemish, at such time as the air was temperate, and the Moon in the waining. Likewise the same Author prescribing unto us

A time wherein Apples are to be gathered that they may last the longer, biddeth us to do thus. About August, choose, saith he, the sweetest Apples, such as be not over ripe, and they will be kept long. *Pliny* counselleth us to gather them after the Equinoctial in Autumne, but never before the Moon be fifteen dayes old, nor yet before one of the clock. And *Palladius* shewes,

What time Pears are to be gathered in, that they may last long.

In a calm day, when the Moon is in the waining, and that also toward the latter end, betwixt the two and twenty and twenty day of the Moon, you must take them off the Tree with your hand, at such time of the day as the Sun is in some strength of heat, that is, either betwixt seven and ten in the morning, or else betwixt two and five of the clock in the after-noon: and the Pears which you so gather, must be somewhat hard and green. *Pamphilus* an Husband-man prescribes

A certain time wherein to gather Cherries, that they may last long,

Cherries are a kinde of fruit that will soon wither; and yet if you gather them before the rising of the Sun, and so lay them up, they will be fresh and good a great while. *Palladius* prescribes

A certain time wherein to gather Medlars, that they may last long.

They are to be gathered, saith he, in a fair day about Noon-tide; and they must not be thorough ripe. *Columella* saith, that

The time wherein you gather Pomegranates to be laid up and preserved, must be a fair day when the air is temperate. *Pliny* would have you to let them be well dried in the Sun, that there be none of the nights dew left upon them. *Didymus* chooseth

A certain time wherein Grapes are to be gathered, that they may last long.

If you would lay up Grapes that they may last all the Winter long, you must, saith he, gather them after the full of the Moon, when the air is clear and calm, about four of the clock after-noon, when all the dew is quite dried off from them: you must gather them when they be at the best, even in their full strength, so that they be neither raw, nor yet past their ripest strength. Authors likewise do prescribe

A certain time wherein Corn is to be gathered and laid up.

When you have reaped your Wheat or Barley, you must let it lye abroad in the field one or two dayes, or at the least one whole night, and carry it away before the rising of the Sun, that so it may be thoroughly cold when it is laid into the barns for

for it is that which will cause the Corn to last much the longer. *Columella* shewes, and he teaches it of his own experience

What time Beans are to be gathered, and layed up to be long preserved,

You must tell your Beans, saith he, when the Moon is in the very last of her last quarter, and you must sell them before Day-light; then, when they are waxed dry upon the floor, presently you must thresh them out before the Moon is renewed; and when you have laid them on cooling, then carry them into your Garner to be laid up: for if you deal thus with them, you shall be sure to preserve them from the worm, which otherwise will breed in them. The very same experiment doth *Palladius* record out of the very same Author. Likewise

Garden Pease may be preserved for a whole year;

if you lay them on drying in the Sun, and when you have fetched out all their moisture, take them out of their shells, and lay them up: for by this means shall you preserve them from putrefaction.

CHAP. V.

Of the manner how to gather fruits; as also how to keep and dresse the stalk that grows into them, whereby we may prevent the first original, and the occasion of their putrefaction.

Whereas our Ancestors did perceive that the first beginning of putrefaction in fruits did arise from the little stalk that grows into them, or from that part of the fruit where the stalk is entertained into it; (for it is requisite, that the beginning of the spoil, and destruction of them should arise in the very same part, where in they began first to live and receive their nourishment) they have therefore devised sundry means whereby to prevent all such mischief and harm, as the stalk might bring upon the fruit. Moreover, fruits are very carefully to be gathered, especially those which we would lay up for store, that they be not knocked and hit one against the other; for the hitting of them together will cause their putrefaction. Besides, we must see that they be in their best estate when we gather them, that they be not perceptive ripe; for as they must not be altogether sharp and green when they are gathered, so neither must they be come to their full ripeness. Furthermore, the fruits that you would lay up, you must take a diligent view of them, and see that they be sound, without any bruise, or speckedness, or worm in them. But let come to examples. And first

How we must gather Apples, and how we must dresse their stalks.

Columella would have such Apples to be preserved, which have a good relish, and are gathered when they are reasonable ripe: and he would have them to be so disposed and placed when they are laid up, that the blossom-end should stand upward, and the stalk-end downward, even so as they grow upon the Tree: but they must not be laid to touch one another; neither must they be thoroughly ripe when they are gathered, but somewhat sharp and sowre. Besides, you must see that every several kind of Apples must be laid up in a several room or cell by themselves: for when sundry kinds are laid together in one cell, there will be a disagreement amongst them, and so they will the sooner putrifie. Experience whereof we have in wine; which if it be made of sundry kinds of grapes, it will not be so durable, as when it is made onely of one kinde. *Palladius* saith, If you keep Apples in store, you must gather them very charyl, that they be taken off from the Tree without any blemish; and you must drench their stalks in scalding pitch, and so place them upon a boarded loft, with the stalk-end downward; and you must take heed that you do not touch them, nor meddle with them till we take them out as being fit for our use. *Pliny* likewise sheweth, that Apples must be placed upon their stalk-ends. *Apuleius* the Greek counselleth us to gather our Apples when they are in their full strength and

and we must take special regard, that they be gathered by hand without any bruise; and then laid up in such sort that they may not touch one another: but in any case they must be sound, and not thoroughly ripe. He saith moreover, that if you besmear the tops of the Apples with the juice of green Rag-wort, it will preserve them from putrefaction. If you would have

Citrons to last long,

Palladius counselleth you to gather them with their boughs which they grow upon, and lay them up in ferial, as we shew before out of *Pontanus*. *Columella* shews

How Pears must be gathered that they may endure long;

namely, if you gather them before they be thoroughly ripe: and *Palladius* saith, that they must be gathered charily by hand, that they may not be bruised; and you must diligently cull out from them, all such as have fallen from the Tree, and lay up none but those that are very sound, and somewhat hard and green, and such as are gathered with their stalks upon them. *Democritus* saith that those Pears will keep best, which are besmeared with pitch about the stalk, and so hung up. We will also shew the manner how to gather;

Cervises, that they may last.

Marcus Varro saith that Cervises are to be gathered even while they are very sowre, and so to be hung up, that they may ripen but slowly, and that also within doors: for if you lay them up when they are grown to some ripeness, they will not last so long. *Theophrastus* by this means procured Cervises to defer their ripening even until Winter. *Columella* saith, they must be charily gathered with your hand, *Pliny* saith, they must be hanged up as they are upon their boughs. *Palladius* saith, they must be gathered when they are hard, and so hanged up together with their stalks in some close and dark place. So

Figs are to be laid up as they are upon their boughs,

as *Africanus* teaches; but, saith he, they must be gathered before they be ripe: for when once they are come to be ripe, they will hang no longer upon their Tree, as other fruits do, but fall off presently. They are also to be gathered and laid up with their stalk or their navel upon them, that is, the part which they hold by, and depend upon their mother: for if they be so gathered, they will last the longer sound and good. *Palladius* also would have them to be gathered while they be green and unripe, and that with their stalks upon them, and so to be laid up. *Cato* saith, that the boughs of the Fig-tree whereon the figs grow, are to be preserved together with their fruit; and those figs that you would keep, must be gathered somewhat green and sowre. *Columella* saith, that Figs, if we would keep them long, must be gathered, neither when they are very ripe, nor yet when they are too green. *Palladius* saith, that if you would have

Peaches well kept,

you must fill up the navel of the Peach, that is, that part of the Peach whereby it closeth with the stalk, with one drop of scalding pitch. I for my part have preserved

Damascus a great while together,

by hanging them up with their stalks, upon the rafters of an house; but there is none so good to be kept, as those that are of a purple colour. *Palladius* would have them to be gathered while they are unripe, yet he would not have them too raw; but in any case they must be very sound, and without any worm, or bruise, or any other blemish. So also the fruit called

Ziziphum may be preserved,

if

if it be gathered with the boughs that it grows upon, and folded or wrapt up in his own leaves, and so hung upon the beams of an house, as *Palladius* sheweth. So

Medlars may be kept long.

if you gather them when they are but half-ripe, and hang them up with their boughs in some house. *Berinius* shews,

How Pomegranates are to be gathered and laid up to last.

You must gather them, saith he, with a very chary hand, lest if you touch them somewhat roughly, they should be hurt or bruised; and that would be an occasion of their putrefaction. *Columella* saith, that Pomegranates are to be gathered with their stalks, and the stalks to be put into an Elder-tree; because the Elder-tree is so full of pith, that it may easily entertain the Pomegranate stalks. The same Author reports out of *Mago* the Carthaginian, that all fruits, which you would lay up in store, must be gathered with their stalks upon them; yea, and if it may be without the spoil or hurt of the Tree, they must be gathered with their boughs too; for this will be very helpful to cause the fruit to last the longer. *Palladius* saith, that Pomegranates may be preserved best, if you gather them sound, and lay pitch upon their stalks, and hang them up in due order: nay, they will keep so much the better, the longer the boughs are, which are plucked off from the Tree with them. *Pliny* saith, that they are to be gathered with their boughs, and the boughs to be stuck into the Elder pith, and so to be preserved. *Cato* shews, how we may preserve

Myrtle twigs with their berries upon them.

They must be taken from the Tree when the berries are somewhat sowre, and so bound up with their leaves about them. *Didymus* hath taught us, how we must gather

Grapes that they may last long.

We must take special heed that every grape be perfect and sound; and for this cause we must have a very sharp knife or hook, to cut off those grapes that are unsound easily and without any stroke, even with one touch as it were. When you gather your grapes, they must be in their full strength, neither too raw, nor yet past their best liveliness. Some cut off the branches together with the clusters; and when they have so done, they espy out all the grapes that are either putrified, or dried away, or unripe, and pluck them off with a pair of nippers, lest they should infect their fellows; and after this, they take the branches whereon the clusters grow, and that end which was cut, they dip into scalding pitch, every one by it self. Others hold, that grapes must be hanged up in some high roof, where the air may have full scope at them; but the grapes must be none of those which grow toward the tops of the branches, but they must be the lower clusters. *Palladius* saith; If we would have grapes to last, we must see that we gather such as are without blemish; they must not be too harsh and sowre, neither must they be over-ripe, but it must be a very clear grape to the eye, and somewhat soft to be felt, and yet it must have a reasonable rough skin. If there be any amongst them that is bruised, or hath any other blemish, we must cut it away; neither must we suffer amongst them any one that is over hard, which the Sun hath not in some sort overcome with his heat. After all this, we must drench the cut ends of the stalks in scalding pitch, and so hang them up.

CHAP. VI.

In what grounds those fruits should grow and be gathered, which we would lay up.

WE must not omit to speak of another necessary observation in this matter; namely, in what ground, in what air, under what Climate, it is best that those fruits, which we should lay up, should grow and be gathered. Whatsoever fruits do grow in moist and waterish, in hollow and low grounds; as also those which grow in such grounds as are much soiled and manured with fat muck; they are much subject to putrefaction; for, in as much as they grow with great store of moisture and heat in them, they have the occasion and original of their own bane within their own bosome. But in wilde fruits, and such as grow upon the tops of mountains, in dry grounds, and such as are not manured at all, and such as the Southern heat doth continually bear upon, it falleth out clean otherwise: for the fruits that grow in such places, are for the most part, dry, and very solide, not abounding either with heat or moisture. *Hesiodus* in his book of Husbandry, never makes any mention of muck or soiling, and questionless, he would never have omitted such a necessary part of Husbandry as this is, but that he saw the inconvenience of it in this respect, that it makes the fruit more subject to putrefaction, and many infirmities. Fruits that grow in wilde and stony grounds, where the wind hath his full force, will preserve themselves without any skill and device practised upon them: wherefore, if other sleights be added, which are helpful to their preservation, they will surely last much the longer. But let us see whether Antiquity hath made any mention of this matter, and first let us hearken to *Theophrastus*, who shews

In what ground there grow the best Dates or Palms to be preserved for store.

If you preserve and lay up any Dates or Palms, saith he, you must make choice of those which grow in sandy grounds, as in that Country which is called Syria cava: and there are in all that Country but three sandy places where they do grow, and these are excellent good to be preserved; those which grow in other places, are not durable, but presently wax rotten. Of all those Palms which Syria yeelds, it is held by some, that none are good to last, but those only which grow in the Palm-valley, a place so called there. But those which grow in Egypt, and Cyprus, and elsewhere, they are all very soon purrified. And *Pliny* reports out of the same Author, that those Palms which grow in salt and sandy grounds, as in Judæa, and Cyrenian Africa, may be preserved: but not those which grow in Cyprus, Egypt, Syria, and Seleucia of Assyria. The same *Theophrastus* speaking of Beans, shews

In what ground there grow the best Beans to be preserved for store.

One Country, saith he, differs from another, and one Climate differs also from another, in respect of the fruits that grow in them, either to be good to lay up, or to be subject to putrefaction. And therefore the Beans that grow in Apollonia which is neer to the Ionian Sea, are not subject at all to any worms or rottenness; so that they are best of all other to be preserved. Likewise the Beans that grow about Cizicum are very durable.

CHAP. VII.

How fruits must be shut up and kept close that the air come not at them.

WE have shewed before, that, if we would preserve fruit long, we must keep away both heat and moisture from them; both which qualities are found in the

Of increasing Household-stuffe.

the air. Wherefore we will first set down the devices of Antiquity in this behalf; and then our own devices and experiments. And first

How to keep Apples close without putrifying.

We will begin with *Aristotle*, who saith, that fruits are to be kept in bottles full of air, that so the extrinsecal air may be excluded; for thus he speaks in his Problems. Whence cometh it, that the fruits of Trees, and flesh, and such like, do last without putrefaction, when they are shut up in bottles full of air, or in other vessels that are well covered, and closed up on every side? It is because all things are wont to be corrupted when they are stirred or removed, but when things are filled, they stand unmoveable? for it cannot be, that any thing should be moved, unless there be some vacant space to be moved in: now those things which are so shut up, are every way full, and therefore are preserved without corruption. As if he should say; the air which is so enclosed, cannot so soon procure putrefaction, by reason that it is not so subject to the daily alterations of the circumstant air. Or, if the fruit could send forth their eat and moisture which is in them, yet it should be kept in upon them by the fullness of the bottles. But let us see what the Masters of Husbandry do teach concerning this matter. As for example

How to preserve Citrons close without putrifying.

Palladius doth thus preserve them from the air. He shuts up every Citron in a several vessel by it self, and plaisters them up, and sets them orderly in a fit place prepared for that purpose. *Soriano* saith, that the Pome-Citron must be very well plaistered over with stamp mortar, that so it may keep one whole year together, without any harm or blemish. So have others taught us the way

How to keep Apples shut up close.

Columella saith, that every several kind of Apples is to be placed in a several cell by themselves; for when divers kinds are shut up in one and the same cell, they will not agree so well together, but will soon putrifie: But when you have disposed of your Apples that they are set in good order, then shut up the lids of the cistern or cell upon them, and plaister the lids over with lome, that hath straw chopt in it, lest the air get in. *Palladius* would have every apple placed by it self in a several earthen vessel, which must be pitched within, and plaistered over with mortar, or else they may be lapt up in clay, and so preserved. *Pliny* saith, that the custom in his time was, to make choice of the goodliest apples, and to plaister them over with mortar or wax, that it may be like a crust upon them: but, saith he, they must be fully ripe first; for otherwise they will grow and wax bigger, and so break out of their houses. Others put every several Apple or Pear into a several earthen vessel, and besmear the vessels all over with pitch, and then put the vessels with the fruit in them, into a barrel or tub, and so preserve them. *Apuleius* was wont to preserve them in an earthen pot laid all about on the inside with wax. Some preserve them by lapping them up in Reits or Sea-weed, and so shutting them up into earthen pitchers: but they must be every one wrapt up severally by it self, and so laid, that they may not touch each other; and besides, the pitchers must be very well and close covered. *Columella* prescribes this course whereby

Quinces are to be shut up, that they may last.

They must be wrapt up in Fig-leaves; and you must take some Potters white earth and put in Wine-lees to it, to make mortar of them, and with that mortar besmear the Quinces: then you must put them into some new vessels, and cover them all over with some dry plaistering that they may not touch one another. *Palladius* puts them between two tile-sheards, and closes them up with Lome round about; and then covers them over with dry plaistering, and so

layes them up in a New pot or basen, that they may be kept asunder. *Democritus* doth first cover them over with leaves, and then he makes mortar of clay or of some Potters chalk with hair chopt into it, wherewith he besmeares the Quinces; and when he hath dried them in the Sun, he layes them up: and whensoever he would use any of them, he breaks up their case, and there finds his Quinces in the same taking as they were, when he put them in. But *Pliny* teacheth us very briefly, that if we would keep Quinces long, we must shut them up so close, that no air may come at them. By the like means, you may preserve

All things close exceeding well,

Magus, when he would preserve any fruit close, he covers them all over very carefully with Potters chalk, and then dries it in the Sun; and if there happen to be any chap in the mould, he stoppeth it up with lome, and so when it is drie, layes it up. Others take a new earthen pitcher, and strew it with the dust or shavings of Poplar, or else of the Holm-tree; and then they place the fruit in it, in such sort that there lies some of the dust betwixt every fruit: then they boord that space, and make a floor over that stoary; and having so done, they strew the second stoary with the like dust, and there also dispose of their fruit as in the other stoary: then they boord that space too, and make a third stoary, and so a fourth, and so forward till the pitcher be filled up: and when it is full, they lay a covering upon it, and plaister it over very carefully with thick lome. Others put their fruit into a barrel, but they place them in such order, that the one may not touch the other; and when they close up the barrel again, as *Palladius* reporteth. *Africanus* teacheth a way whereby

Figs may be shut up to be preserved long,

You must take a green Gourd, and make in it certain cells or hollow places of receipt, for every several fig a several cell; Into these cells you must put your figs, and wrap the gourd about with a swathe of cloath or leather, and then hang up the gourd in a dark place where neither fire nor smoke may come at them: But you must see that the figs which you would thus preserve, have their tails at stalks upon them. Others take a cup of glasse, or some other cup that you may see thorough, and set it upon the figs with the mouth downward, and stop up with wax every place round about, that no air may come within the cups mouth; and so the figs are preserved without any corruption. *Palladius* rehearseth the very same experiment out of the same Author, Likewise

Cervises may be shut up in barrels,

and thereby be preserved a great while. You must take Cervises presently as they are gathered, and make choice of those that are not bruised nor blemished any way: These you must put into a barrel, and shut up the mouth of the barrel very close, and plaister it over with mortar. Or else you may take clay-mortar, that is well made, and beaten together, that it may be about the thickness of honey, and drench your Cervises in it, and then hang them up: so you may preserve them sound a while; and afterward you must wash them, that the mortar which sticks upon them, may fall off. So, the fruit

Ziziphum may be shut up in earthen vessels

to be long preserved, as *Palladius* sheweth. But they must be gathered by hand, and that not before they be ripe; and you must shut them up in long earthen vessels, and plaister them over, and so lay them up. He sheweth also that

Medlars, and the fruit Tuber may be shut up in pitchers, so to be preserved.

You must put your Medlars into pitchers, that are besmeared with pitch on the inside; but the pitchers wherein you put your Tubers, must not only be pitched on the inside, but also daubed over on the outside. So *Didymus* sheweth, that

Myrtle-berries

Myrtle-berries may be very well kept

so last long, if you gather them when they are green, and put them into a vessel, that is not pitched, and so cover it close, and lay them up. Others lay them up with tails or stalks upon them. *Palladius* sheweth, that

Nuts may be long preserved,

if you shut them up close in coffers; but the coffers must be made of Nut-tree; The same *Palladius* shews, that

Chest-nuts may be long preserved,

if you put them in wicker baskets, and plaister up the baskets round about: but the rods which the baskets be made of must be Beechen-rods; and they must be made up so close, that no air may come at that fruit which is in them. Likewise

Roses may be shut up to be preserved,

if you take green Barley being plucked up by the roots, and put them into a barrel that is not pitched, and lay Roses in amongst it before they be blown: for by this means you may keep them long. So also you may shut up

Lillies, so make them last a whole year.

You must gather them with their boughs, as they grow, before they be blown, and put them into new earthen vessels that were never pitched, and when you have covered the vessels, lay them up; and so shall you have Lillies of a year old. But if you have use for any of them in the mean time, bring them forth into the Sun, and by the heat thereof they will be opened and blown. We will shew also out of *Didymus*, how

Grapes may be shut up to last long,

Some take certain cases that are pitched all within, and when they have strewed them with the dust or dry powder of the Pitch-tree, or the Firre-tree, or the black Poplar-tree, or else with the dry flower of Millet, then they put in their grapes; and so they last long: but they take their grapes presently after the time of Vintage, and make special choice of those grapes that are without any bruise or blemish, and they shut up the mouth of the vessels very close, and overlay them with mortar. Or else they may be drenched in clay-mortar, that is well beaten, and somewhat liquid, and then be hanged up, and so kept for a while, and afterward when you would use them, wash them over, that the mortar may fall off. *Columnella* saith, you must take the great Tear-grape, or else the hard-skinned grape, or else the fair purple-grape, from the Vine, and presently pitch their stalks with hard pitch: then take a new earthen Varr, and fill it with dry chaffe well sifted, that it be without dust, and so hang up your grapes upon it: then take another Varr, and cover therewith the former, grapes and all: and when you have laid the brims of both vatts together, then daube them up with more that is made with chopped straw; and when you have so done, place them in a very dry loft, and cover them all over with dry chaffe.

Wheat may be laid up close to be preserved,

by putting it into caves or pits of the earth, as we have shewed out of *Varro*; for the Cappadocians and Thracians put their Corn into Caves and Dens; the Spaniards put it into certain pits, and make special provision that the moisture and air may not come at them; except it be when they take out any for their use; for if the air do not breath upon it, it will be free from the mice and such like vermine: and it is known, that Corn being thus laid up, hath been kept clean and sweet fifty years together. *Marcus Varro* saith, that

Beans and Pulse have been laid up in vessels, and so preserved for a long time:

but

but they must be oyle-vessels, and they must be covered over with ashes. *Pliny* writes the very same experiment out of *Varro*; that Beans and Pulse being laid up in oyle-buts, and covered over with ashes, have lasted a great while; and being laid up in some hole of the earth, they have lasted an hundred and twenty years. So the Pulse called

Lintels, have been preserved long,

as *Columella* sheweth: for if you put them into oyle-vessels, or else into salting-tubs, that they may be full, and so plaister them over with mortar, whensoever you take them forth again for your use, you shall find your Lintels sweet and good.

CHAP. VIII.

How the Ancients, when they had put their fruit into certain vessels, and so shut them up close, did put them also into some other vessels full of liquor.

Howsoever the Ancients, by making up their vessels close, did shut out and keep away the air as being the Author of all putrefaction, so that it could not come in to the fruit: yet they did not by this means keep away the air out of those places where the vessels were laid, but that as the circumstant air was changed, either being disposed to heat, or cold, or drouth, or moisture, so the air also that is within, mult needs be changed, and consequently, the fruit also must be affected with the same change. Wherefore, for the avoiding of all inconveniences which this way might eniue, after they had plaistered their fruit-vessels, and so made them up fast, they did drown these vessels in divers and sundry kinds of liquors. And surely not without great reason, as experience shews. For I have oft-times observed it, being seriously employed in these affairs, that if the air be uniform, and without alteration, the fruits and flowers that have been shut up in vessels of glass, have lasted long without any putrefaction: but when once they felt any alteration in the air, presently they began to putrifie. For this cause are those vessels to be drowned in Cisterns, or ditches, or some places underneath the ground, that so the variable alterations of the air may not be felt by the fruit. And, to descend to experiments, we will first shew,

How Quince-pears being shut up close, may be drowned for their better preservation.

An experiment which *Democritus* hath set down. You must put your Quince-pears into a new earthen-vessel, and then cover it, and pitch it all over, and so put it into a but of wine; but so, that they may have scope to swim upon the top of the Wine: for by this means shall you keep your fruit fresh and good for a long time; and besides, the wine wherein they float, will have a very fragrant savour. Likewise

Apples being shut up close, and then put into Cisterns, will last long,

As *Palladius* sheweth. You must put your apples, saith he, into earthen vessels, well pitched and made up close: and when you have so done, drown those vessels in a Cistern, or else in a pit. *Pliny* putteth apples in earthen Basons, and so let them swim in wine; for, saith he, the wine by this means will yield a more odoriferous smell. *Apuleius* saith, that Apples are to be put into a new pot, and the pot to be put into a Hogs-head of wine that there it may swim, and play on the top of the wine; for so, the Apples will be preserved by the wine, and the wine will be the better for the Apples. So

Figs being shut up close, may be drowned for their better preservation,

As *Africanus* affirmeth. They take figs, saith he, that are not very ripe, and put them into a new earthen vessel; but they gather them with their tails or stalks upon them, and lay them up every one in a several cell by itself: and when they have so done, they put the vessel into an Hogs-head of wine, and to preserve their figs. I have also proved it by experience, that

Teaches

Peaches being shut up in wooden Cisterns, have been well preserved by drowning.

And I have proved it also in other kinds of Apples, that if they be shut up in a small vessel that is very well pitched on the utter side, and so drowned in the bottom of a Cistern of water, and kept down by some weights within the water, that it may not float, they may be preserved many moneths without any putrefaction. By a sleight not much unlike to this,

Pomegranates may be preserved in a Pipe or But that is half full of water,

as *Palladius* sheweth. You must hang up your Pomegranates within the But; yet so, that they must not touch the water; and the But must be shut up close, that the wind may not come in. And as fruit may be thus preserved, if the vessels be drowned in water or other liquor; so there are some of opinion, that, if you hide those vessels underneath the ground, you may by this means also elchew the danger of the alterations that are in the air. *Columella* sheweth, that

Cervises being shut up close, and so laid under ground, will thereby last the longer.

When you have gathered your Cervises charily by hand, you must put them into vessels that are well pitched, and lay also pitched coverings upon them, and plaister them over with mortar: then make certain ditches or trenches about two foot deep in some dry place within doors; and in them to place your pitchers, that the mouth may be downward: then throw in the earth upon them, and tread it in somewhat hard. It is best to make many trenches, that the vessels may stand asunder, not above one or two in a trench; for when you have use of them, if you would take up any one of the vessels, none of the rest must be stirred; for if they be, the Cervises will soon putrifie. *Pliny* reports the like out of *Cato*: that Cervises are put into earthen vessels well pitched, the covering being plaistered over with mortar, and then put in certain ditches or pits about two foot deep; the place being somewhat open, and the vessels set with the mouth downward. And *Palladius* writes out of those two Authors, that Cervises must be gathered while they be somewhat hard, and laid up even when they begin to be ripe, they must be put in earthen pitchers, so that the vessels be filled up to the top, and covered over with mortar, and laid in a ditch two foot deep, in a dry place where the Sun cometh; and the mouths of the vessels must stand downward, and the earth must be trodden in upon them. The same Author writeth that

Pears being shut up in vessels, and so laid under the ground, will last the longer.

You must take those pears which are hard both in skin, and in skin and substance: These you must lay upon an heap; and when they begin to wax soft, put them into an earthen vessel which is well pitched, and lay a covering on it, and plaister it over with mortar. Then the vessel must be buried in a small ditch, in such a place as the sun doth daily shine upon. Others as soon as the pears are gathered, lay them up with their stalks upon them in pitch vessels, and close up the vessels with mortar or else with pitch; and then lay them abroad upon the ground, covering them all over with sand. Others make special choice of such pears as are very round, somewhat hard and green; and these they shut up into a pitch vessel, and then cover it and set the mouth of it downward, and bury it in a little ditch in such a place as the water runs round about it continually. In like manner also

Apples being shut up close, may be hidden within the ground for their better preservation,

As *Pliny* sheweth. You must dig a trench in the ground about two foot deep, and lay sand in the bottom of it, and there put in your apples; then cover the pit first with an earthen lid, and then with earth thrown upon it. Some put their apples in earthen basons, and then bury them. Others put them into a ditch that hath sand cast into the bottom of it, and cover it onely with dry earth. The like device it is whereby

Pome-

Pomegranates are preserved in small Buts which have sand in them.

You must fill a small But up to the middle with sand, and then take your pomegranates, and put the stalk of them every one into a several case, or into the bough of an Elder-tree; and let them be so placed asunder in the sand, that the fruit may stand some four fingers above the sand: but the vessel must be set within the ground in some open place. This also may be done within doors, in a ditch two foot deep. Others fill up the But half full of water, and hang the pomegranates within the But, that they may not touch the water; and shut up the But close that no air may come in. *Cato sheweth how*

Filberds may be preserved within the ground,

You must take them while they be new, and put them into a pitcher, and so lay them in the ground; and they will be as fresh when you take them forth, as when you put them in. In like manner *Palladius* sheweth that

Chestnuts may be preserved,

if you put them in new earthen vessels, and bury them in some dry place within the ground. He saith also that

Roses being shut up, may be buried in the ground for their better preservation, if they be laid up in a pot, and well closed, and so buried in some open place. But now we will shew

How all things that are shut up, may be preserved for many years.

Fruits are to be laid up in vials of glass, as we shewed before: and when the pipe or neck of the glass is stopp'd close up, then they are to be drowned in cisterns, and they will last good for certain whole years. Likewise, flowers are to be closed up in a vessel that is somewhat long, and the neck of it must be stopp'd up, as we shewed before, and then they must be cast into the water: for by this means they may be kept fresh for a long time. I have also put new wine into an earthen vessel that hath been glazed within, and have laid it in the water with a weight upon it to keep it down; and a year after, I found it in the same taste and goodness, as when I put it into the vessel. By the like device as this is, we may preserve

Things that are shut up, even for ever,

if we wrap them up in some commixtion with other things, so that the air may not pierce them through; but especially, if the commixtion it self be such, as is not subject to putrefaction. I have made trial hereof in Amber, first reducing it to a convenient softness, and then wrapping up in it that which I desired to preserve: For whereas the Amber may be seen thorow, it doth therefore represent unto the eye the perfect semblance of that which is within it, as if it were living, and so sheweth it to be sound, and without corruption. After this manner I have lapped up Bees and Lizards in Amber, which I have shewed to many, and they have been persuaded that they were the Bees and the Lizards that *Martial* speaks of. We see every where that the hairs of beasts, and leaves, and fruits, being lapped up in this juice, are kept for ever: the Amber doth eternize them. *Martial* speaks thus of the Bee, A Bee doth lie hidden within the Amber, and yet she shines in it too; as though she were even closed up within her own honey: A worthy reward she hath there for all her labours; and, if she might make choice of her own death, it is likely she would have desired to die in Amber. And the same Author speaks thus of the Viper, being caught as it were in the same juice: The Viper comes gliding to the dropping Pine-tree, and presently the Amber juice doth overflow her: and while she marvels at it, how she should be so entangled with that liquor, upon the sudden it closeth upon her, and waxeth stiff with cold. Then let not *Cleopatra* boast her self in her Princely Tomb, seeing the Viper is interred in a Nobler Tomb than she. But if you desire to know how to make Amber soft, though there be divers ways whereby

whereby this may be effected, yet let this way alone content you, to cast it into hot boiling wax that is scummed and clarified: for, by this means it will become so soft and pliant, that you may easily fashion it with your fingers, and make it frangible to any use. Onely you must be sure that it be very new.

CHAP. IX.

How Fruits may be drenched in Honey, to make them last for a long time.

The Ancients finding by experience, that the shutting up of fruits in vessels, and the drenching of those vessels in water, was a notable preservative against corruption, did thence proceed farther, and began to drench the fruits themselves in divers kinds of liquors; supposing that they might be the longer preserved, if they were sowed in honey, wine, vinegar, brine, and such like, in as much as these liquors have an especial vertue against putrefaction: For honey hath an excellent force to preserve, not fruits onely, but also even the bodies of living creatures from being putrefied, as we have elsewhere shewed that *Alexander's* body, and the carcases of the *Hippocentaur* were preserved in honey. Meer water they did not use in this case; because, that being moist in it self, might meer rather to cause putrefaction. But of all other liquors, honey was most in request for this purpose, they supposing it to be a principal preserver against corruption. *Columella* saith

That Quinces may be preserved in honey without putrefaction;

We have nothing more certain by experience, saith he, then that Quinces are well preserved in honey. You must take a new flagon that is very broad brimmed, and put your Quinces into it, so that they may have scope within, that one may not bruise another; then when your pot is full to the neck, take some withy twigs, and plat them over the pots mouth, that they may keep down the Quinces somewhat close, least when they should swell with liquor, they should float too high: then fill up your vessel to the very brim with excellent good liquified honey, so that the Quinces may be quite drowned in it. By this means, you shall not onely preserve the fruit very well, but also you shall procure such a well relished liquor, that it will be good to drink of. But in any case take heed, that your Quinces be through ripe which you would thus preserve: for if they were gathered before they were ripe, they will be so hard, that they cannot be eaten. And this is such an excellent way, that though the worm have seized upon the Quinces before they were gathered, yet this will preserve them from being corrupted any farther: for such is the nature of honey, that it will suppress any corruption, and not suffer it to spread abroad: for which cause it will preserve the dead carcases of a man, for many years together, without putrefaction. *Palladius* saith, that Quinces must be gathered when they are ripe, and so put into honey, whole as they are, and thereby they will be long preserved. *Pliny* would have them first to be smeared over with wax, and then to be sowed in honey. *Apicius* saith, Quinces must be gathered with their boughes and leaves, and they must be without any blemish, and so put into a vessel full of honey and new wine. The Quinces that were thus dressed, were called *Melimela*, that is to say, Apples preserved in honey: as *Martial* witnesseth, saying, Quinces sowed in pure honey, that they have drunk themselves full, are called *Melimela*. Likewise *Columella* sheweth that

Other kind of Apples may be so preserved,

Not onely the *Melimela*, but also the Pome-paradise, and the Sessian Apples, and other such dainties may be preserved in honey: but because they are made sweeter by the honey, and so lose their own proper relish which their nature and kind doth afford, therefore he was wont to preserve them by another kind of practice. *Palladius* saith, That

Pears may be preserved in Honey,

if they be so laid up therein, that one of them may not touch another. So *Africanus* reporteth, That

Figs may be long preserved in Honey,

if they be so disposed and placed in it, that they neither touch each other, nor yet the vessel wherein they be put; and when you have so placed them, you must make fast the lid of the vessel upon them, and there let them lie without troubling them. And *Palladius* reports the same: Green Figs, saith he, may be preserved in Honey, if you place them so that they may not touch each other. *Florentinus* also sheweth, That

Cherries may be preserved in Honey,

if you put them into a vessel that is strawed in the bottom with Savory, and so cast some honey upon them; but your honey must be somewhat sharpe. So likewise

Medlars may be preserved in Honey,

to last a great while without rotting, as *Palladius* sheweth: but then they must be gathered before they be thoroughly ripe. *Martial* sheweth also, That

Nuts may be preserved in Honey,

to be green all the year long; and he speaks it of his own trial and experience. You must take green Nuts, and pluck them out of their shells, and so let them be sowed in honey: and the honey wherein they are sowed, will become very medicinable, inasmuch that if you make a potion of it, it will be very helpful to cure the Arteries, and the jaws. *Palladius* saith, That

Peaches may be preserved in Honey,

if you take out the stone before you sow them; and besides that they will last long, this will also make them to be very well relished. He saith also that they may be well preserved in the liquor Oxy-mel. To be brief, *Columella* saith plainly that there is no kind of fruit but may be well preserved in honey. But he prescribes it for a general rule in this case, that every kind of fruit should be preserved in several by it self: for if you lay up divers kinds of fruits together, one of them will corrupt and marre the other. So also

Grapes may be preserved in Honey,

and they will last long without any blemish in them, if they be so preserved, as *Diadymus* writeth. But we will shew now,

What kinds of fruits are best preserved in Honey.

For, I have endeavoured my self in this Practice, how to keep fruits without putrefaction, and for this cause, I laid up all kinds of fruits in vessels of glass filled with honey, that so I might prove, which might be preserved longest: and I found great difference among them, some kinds lasting long and some but a little while. For, the fruits that were by their own kind, full of moisture, did attain the honey; so that the honey being it self attainted, was not possibly able to preserve the fruit from putrefaction. Grapes, Figs, and Peaches are soon purified by reason of their moistness; Quinces, Apples, and Pears do last longer uncorrupted; but Nuts will will last green and sound a whole year together.

CHAP. X.

How fruits may be long preserved in ordinary wine, or soddin wine, or new wine, or else in wine-les.

The Ancients likewise perceiving, that wine would keep all things, and that grapes-stones lighting into the wine as it was barrelled up, did continue whole in the barrels for the space of a whole year; thence they gathered, that those fruits which were laid up in wine, would be well preserved from putrefaction. Neither did they stay there, but also proceeded to use soddin wine, new wine, vinegar, and wine-les, for that purpose, because all these have a smatch of the substance of wine it self. But we considering that there may be a very pure and durable liquor extracted out of the substance of wine (for wine, as it is of it self, will sooner be corrupted) have therefore used the help of that extraction, whereby to preserve things sound and good time out of mind. But to return to them, and set down their examples. *Palladius* sheweth, That

Quinces may be preserved in wine.

For, if we lay them up in vessels filled with very good wine, half with ordinary wine, and half with new wine, we shall by this means preserve Quinces a great while. Others sow them in barrels of new wine only, and so close them up; whereby they cause the wine to yield a very fragrant smell. So *Democritus* makes choice of the fairest and soundest quinces, and putteth them into barrels of new wine, and thereby doth preserve his quinces and better his wine. So

Apples may be preserved floating in wine,

as the same Author sheweth. You must put some few apples into a barrel of wine that they may float up and down, and so shall you also better the wine. *Democritus* would have them to be put into earthen pots; but *Apuleius* would have them put into barrels, and so closed up; and thus, saith he, shall you procure an admirable sweetness and pleasantness in the wine. Others would have them put into a new pot, and the pot to be drenched into a barrel of wine, so that they may there swim, and then the barrel to be made up close; for this will be best both for the wine and also for the apples. Likewise

Figs may be long preserved in wine,

as *Africanus* sheweth. You must make a new earthen pot, not altogether round, but rather somewhat square, having a good sound bottom; then you must gather your figs with their sprigs and stalks, and that before they be through ripe; then put them fresh into your vessel, and place them so that they may lie from each other a pretty distance; and so put them in a barrel full of wine, and there let them swim; but the barrel must be very well closed up, that the air get not in: and until the wine change and become sourish, the figs will never change, but continue in the same estate as when they were put in. *Palladius* doth report the very same experiment out of the very same Author. *Beritius* sheweth, That

Mulberries may be preserved in wine:

But it must be such wine as is made of Mulberries; and the vessels wherein they are put, must be made up very close. Likewise *Pamphilus* sheweth, That

Damascens may be preserved in wine,

if they be put into Hogheads either of sweet wine, or else new wine, there to swim up and down, and the Hogheads well covered. *Palladius* also teacheth, That the fruit

Ziziphum may be preserved in wine.

so that it shall not have any screwls or wrinkles: for, if it be fresh gathered, and supplied with drops of new wine, it will continue plump and full without any wrinkles. *Didymus* sheweth

How Grapes may be preserved in wine,

You must take a barrel that is half full of new wine, and therein hang up your grapes in such sort, as the clusters may not touch each other, nor any of them touch the wine: for by this means they will continue as sound as they were upon the Vine. Somedo preserve them in wine that is alayed with water. Grapes thus preserved in wine, have been in great request among the Ancients. *Athenus* makes mention of them out of *Eubulus* in *Agglutinato*: you must, saith he, minister unto him good store of grapes preserved in wine: And *Pherocrates*, among other things that are to be eaten, makes mention of grapes that were taken out of wine. *Cato* sheweth, That

Pears may be long preserved in sodden wine,

especially the Tarentine-pears, and the Muft-pears, and the Gourd-pears. *Varro* saith, That the pears called Anciana, and Sementina are to be preserved in sodden wine. *Pliny* saith, That the Tarentine-pears, and the Anciana are to be preserved. *Palladius* saith, That they may be preserved either in sodden wine or else in new wine; but, saith he, The vessels which they are put into, must be filled up with that liquor wherein they are to be preserved; which very same precept he learned out of *Demoeritus*. *Columella* sheweth how to make this kind of sodden wine of that sweet wine which is called Mustum. *Palladius* sheweth also, how that kind of

Peaches, which hath the hardest stone, may be preserved long in sodden wine,

You must fill up the Navel of the Peach (or that place wherein the stalk was fastened) with a drop or two of scalding pitch, so that the wine may not get into the peach by that passage; and then shut up the vessel very close, that the air may not get in. *Columella* saith, That

Cervises may be long preserved in new wine,

if you plant some dry fennel above them, to keep them under, that still the liquor may overflow them: but the coverings or lids of the vessels must be well pitched, and plaistered over with mortar, that the air may have no access unto them. *Pliny* saith, That Cervises are to be preserved in sodden wine, by the judgement of *Cato*. *Palladius* also saith, That Cervises may be preserved long in sodden wine. *Columella* sheweth

That Grapes may be preserved in new wine,

You must take a barrel that is well pitched, and put into it a certain quantity of new wine; then make a hurdle as it were, of good stiff rods platted together, a little above the liquor: then place upon those hurdles, certain new earthen vessels, and therein so dispose your grapes that they may not touch each other; then cover your vessels and stop them up, after that, make another such a sort of hurdles, and then another, and so forward, as far as the greatness of the barrel will give you leave; and in every one of those rooms place your grapes, as in the first: then take the pitched cover of your barrel, and smear it all over with good store of new wine, and when you have laid it upon the barrel, make it up close, and lay ashes upon it. Others make no more ado, but onely put their new wine into the barrel, and make certain hurdles over the wine, and there hang their grapes out of the reach of the wine, and so cover the barrel and stop it up. The same Author likewise reporteth, That

Damio-

Damofins may be long kept in new Wine.

About harvest time, you must gather Damofins not being thoroughly ripe, nor yet too green, (but they must be wilde Damofins, such as are in colour like to the Onix-stone) and you must dry them in some shadowy place, the third day after they were gathered: then you must mingle vinegar with new Wine, or else with sodden wine, in equal portions, and so put your Damofins into it. But they will be preserved the better, if you make your medley of a certain quantity of vinegar, blended with twice so much water. Or else you may take the purple-coloured Damofins, and lay them up in an earthen vessel well pitched, and then fill it either with new, or else with sodden wine, so that the whole fruit may lie under the liquor; and then lay the covering upon the vessel, and plaister it up. We may also preserve

Cucumbers in the Lees of Wine,

as the Quintiles are of opinion. You must, say they, put your Cucumbers into the Lees of White-wine, before it be sowre, and see that your vessel be top-full; for by this means your Cucumbers will last fresh and good a great while. *Didymus* writes, that

Olives and Grapes may be kept together.

You must take Grapes while they be fresh, and new, and whole, and lay them up in a vessel amongst Olives, so placed, that every Olive may stand betwixt two Grapes, and so every Grape betwixt two Olives; and thus, the vessel being well closed up, they will preserve each other. *Columella* saith, that

Corneile, or Hamberry may be kept in Lees;

and if it be well preserved so, it will serve to be used in the stead of Olives. *Ovid* declares this in the eighth book of his *Metamorphosis*. *Columella* shews that

Grapes may be preserved fresh and green in the Lees of wine.

You must gather your grapes when they are of a reasonable ripeness, and then lay them upon certain hurdles, so that one cluster may not touch the other: then bring them within doors, and tuck away the dry, and withered, and rotten grapes with a pair of tuckers: and when they have lyen a while cooling out of the Sun, take three or four clusters according as the bigness of your pot is, and put them into it amongst the Lees; and let the lid be made up fast with pitch, that the liquor may not break forth. Then you must take a great many of Vine-stalks, and squeeze or press them well, with their grapes upon them: then lay the stalks and husks in the bottom of a barrel, and therein place your pots that you have filled with Lees and Grapes, and let their mouths stand downward, and let them stand in distance each from other, so that you may ram in good store of Grape-kernels betwixt them: and when you have filled the room with Grape-stones stuff in hard about the pots; you must make a second room like the first, and fill it up in the same manner: likewise you must make a third room and so forward, till the barrel be thoroughly filled even to the very brim, with pots, and Grape-stones crammed in fast and thick about them; then straightway cover the barrel and make it up close, and lay ashes upon it. But you must look to it, when you take forth any of the pots, that you take out a whole row together: for the Grape-stones being stamped in thick together must not be stirred; if they be, they will become sowrish very soon, and so they will marre the grapes. The Quintiles say, that

Cucumbers may be preserved in vinegar;

and that very fresh and in their natural strength, if you hang them up in a vessel that hath some vinegar in it, that they may not touch the vinegar, and then close up the vessel fast, that the air may not pass into it; for by this means you may have green and new Cucumbers in the Winter-time. So all other fruits may be preserved

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ved in vinegar: but because vinegar doth mar the taste of them, therefore we will not speak of such preservings. But hereby we have learned to preserve, time out of mind,

All things with distilled wine:

for wine is of it self subject to putrefaction many wayes: but when it is often distilled, that the quintessence be extracted from it, this extraction is free from all putrefaction whatsoever: wherefore all things that are drenched in this kind of liquor, if the vessel be carefully closed up, must needs last unpurified even for a whole age, nay for all eternity. At Rome, I saw a fish that was drenched in the water that had been distilled out of the Vine, and she was preserved five and twenty years; as fresh as while she was alive: and at Florence, I saw the like of forty years continuance: the vessel was made of glasse, and made up with the seal of *Hermes*. And I make no question, but that all things that are sownd in this kind of liquor, will last sound and good for many ages. How many sorts of things I have preserved by this one means, it were too long here to rehearse.

CHAP. XI.

That fruits may be very well preserved in salt-waters.

NExt after wine, salt-water is of special use for preserving from putrefaction: for such things as have been drenched therein, have lasted long very sound and good: The Ancients saw that whatsoever was preserved in salt, was kept thereby from putrifying: wherefore, that they might preserve fruits from corruption, they have used to drench them in salt-waters. *Homer* calls salt a divine thing, because it hath a special vertue against putrefaction, and by it, bodies are brought to all eternity. *Plato* calls it the friend of God, because no sacrifices were welcome to him, without salt. *Plutarch* saith that the Ancients were wont to call it a divine influence, because the bodies of creatures that were seasoned with salt from above, were thereby acquitted from corruption. Salt binds, and dries, and knits together, and doth privilege bodies from putrefaction, that in their own nature must needs putrifie: as the Egyptians custome manifestly sheweth, who were wont to season their dead bodies with salt, as *Herodotus* writeth. But let us come to examples, *Benjamin* saith, that

Pomegranates are preserved in salt-waters.

You must take sea-water, or else brine, and make it boil, and so put your Pomegranates into it; and afterward when they are thorough cold, dry them, and hang them up in the Sun; and whensoever you would use them, you must steep them in fresh-water two dayes before. *Columella* rehearses the opinion of a certain Carthaginian touching this matter. *Mago* would have, saith he, that Sea-water should be made very hot, and Pomegranates being tied together with thread or broom-twigs, to be drenched in it till they change their colour, and then to be taken forth and dried in the Sun for three dayes, and afterward to be hanged up: and when you would use them, you must steep them in fresh and sweet water for the space of four and twenty hours before, and so they will be fit for your use. *Pliny* also reports out of the same Author, that Pomegranates are first to be hardened in hot Sea-water, and then to be dried in the Sun three dayes, and so to be hung up, that the evening dew come not at them; and when you would use them, to steep them first in fresh water. *Palladius* writes the same out of *Pliny*; and he sheweth also, that

Damascus may be preserved in salt-waters.

They must be fresh gathered; and then drenched either in brine, or else in sea-water cooleding hot, and then taken forth, and dried either in the Sun, or else in a warm Oven. *Columella* would have them drenched in new wine, sodden wine, and vinegar; but he gives a special charge also to cast some salt amongst them, lest the

worm

Of increasing of Household-stuffe.

worm or any other hurtful vermin: do grow in them. *Palladius* likewise sheweth, that

Pears will last long in salt-water:

first the water is to be boiled, and when it begins to rise in surges, you must skim it; and after it is cold, put into it your Pears which you would preserve: then after a while take them forth and put them up in a pitcher, and so make up the mouth of it close, and by this means they will be well preserved. Others let them lie one whole day and night in cold salt-water, and afterward steep them two dayes in fresh-water, and then drench them in new wine or in sodden wine, or in sweet wine to be preserved. Others put them in a new earthen pitcher, filled with new wine, having a little salt in it, and so cover the vessel close to preserve them, Likewise

Medlars may be preserved in salt-water:

They must be gathered when they are but half ripe, with their stalks upon them, and steeped in salt-water for five dayes, and afterward more salt-water poured in upon them, that they may swim in it. *Didymus* sheweth also, that

Grapes may be preserved long in salt-water.

You must take some sea-water, and make it hot; or, if you cannot come at that, take some brine, and put wine amongst it, and therein drench your clusters of grapes, and then lay them amongst Barley straw. Some do boil the ashes of a Fig-tree, or of a Vine, in water, and drench their clusters therein; and then take them out to be cooled, and so lay them in Barley straw. The grape will last a whole year together, if you gather them before they be thorough ripe, and drench them in hot water that hath Allome boiled in it, and then draw them forth again. The Ancients were wont

To put salt to Wine, to make it last the longer,

as *Columella* sheweth. They took new wine, and boiled it till the third part was wasted away; then they put it into vessels, there to preserve it for their use the year following: they put a pint and a half of this liquor thus boiled, into nine gallons of new wine unboiled; and after two dayes, when these liquors are incorporated together, they wax hot, and begin to spurge; then they cast into them half an ounce of salt beaten small, and that made the wine last till the next year. *Theophrastus* and *Pliny* write, that

The fruits of those Palm-trees which grow in salt places, are fittest to be preserved; as those which grow in Judæa, and Cyrenian Africk, because those Countries especially do afford salt and sandy grounds: for salt is a great nourisher of these kinds of fruits, and they are preserved long, even by their own saltness; so that the saltier the places are where they grow, the better will the fruit be preserved. So likewise that kind of Pulse which is called

Cicer, is preserved by its own saltness,

without any other dressing; for the nature thereof is, to have a saltish juice within it; whereby it cometh to pass that whereas all other Pulse are subject to corruption, and have some vermine or other breeding in them, onely this kind doth not engender any at all, because of the bitter and sharp saltish juice that is in it, as *Theophrastus* writeth. *Didymus* likewise writeth, that

Beans will last long in salt-water:

for, if they be sownd in sea-water, they will continue long without any blemish. *Pliny* also sheweth, that

Garlick may be preserved in salt-water;

for if you would have Garlick or Onions to last long, you must dip the heads thereof in warm salt-water; so will they be of longer continuance, and of a better taste. So

Cucumbers are preserved in brine,

as the Quintiles affirm; for if you preserve either Gourds or Cucumbers in brine, they will last long. So

Apples and Myrtles may be preserved,

by lapping them up in Sea-weed one by one, so that they may be covered all over with it, and not touch one another, as *Apuleius* sheweth. If you have no Sea-weed, then you must lay them up close in Coffers. *Aristotle* is of opinion, that the fruits of the Myrtle-tree need not to be lapped up in Sea-weed, thereby to keep them from falling off from the Tree, because they will stick on of themselves till they be thoroughly ripe; but the blades of them are preserved by wrapping Sea-weed about them: and the vapour of the Sea-weed thus wrapped about the blades, will keep the juice of the fruit from being changed to any further maturity, and cause it to continue long at one stay; and this is by reason of the saltness of the Sea-weed, whereby it doth intercept and dry up that moisture which should be derived into the fruit, to ripen it. We may learn also to preserve

Olives in brine, to have them good a year after.

Marcus Cato saith, that those kinds of Olives which are called Orchites, may be well preserved, if they be laid up in brine while they are green; or else, if they be powned with Mustick. *Columella* saith, that the Olives which are called Orchites, and those which are called Panfæ, and the little round Olive called Radiolus, are to be knocked and bearen, and so cast into brine, and then to be taken out of the brine and squeezed, and so cast into a vessel together with the blanched seeds of Mustick and Fennel; then take a good quantity of new wine, and half so much strong brine or pickle, and put it into the vessel, and so the fruit will be preserved. Or else, you may cast your Olives whole into a vessel, and put in strong brine amongst them till the vessel be brim-full, and so take them out for your uses when occasion serveth. There are a certain kind of black Olives, called also Orchites, which *Cato* saith, are thus to be preserved. When they be dry, cast them into salt, and there let them lie for the space of two dayes; afterward take them forth and shake off the salt, and let them in the Sun two dayes together, and so they will be preserved.

Marcus Varro reports the very same experiment out of *Cato*. *Columella* saith; while Olives be yet black and unripe, you must tuck them off the Tree with your hand in a fair Sun-shining day; and call out the sound ones from those that have any blemish; and into every peck and an half of Olives, put a quart and somewhat more of whole salt; then put them into wicker baskets, and there let them lie in salt thirty dayes together, that the Lees or dregs may be still dropping forth: afterward put them into some trey or suchlike vessel that you may wipe away the salt with a sponge; and when you have done so, barrel them up into a Hogs-head full of new wine or else of foddren wine, and by this means they will be long preserved. *Didymus* teacheth to make condite or preserved Olives on this manner. When Olives are almost ripe, you must gather them with their stalks and all: then wash or steep them a whole day in cold water, and afterward lay them a drying upon wicker Lattises, handling them very gently; then put them in the bottom of a vessel, and cast good store of salt amongst them: and into five pecks of Olives, you must put in four gallons and two quarts of brine, and two pints and a half of vinegar: And when you have filled up the vessel, shake them together, that the liquor may swim on the por. *Columella*, *Palladius* and divers others do cast the Olives into Sea-water, and there steep them seven dayes together, and when they have taken them forth, they condite them with brine, and so put them up into some other vessel.

CHAP.

CHAP. XII.

That things may be specially well preserved in Oyl and Lees of Oyl.

OYL, and especially Lees of Oyl, do excellently conserve things, defending them both from the injuries of the Air and of Animals. *Cato* doth in short enumerate the faculties of Lees of Oyl, he subacts the Barn-flores with Lees of Oyl, that Mice may not eat his Corn. That also

He may preserve his Grain in his Garner,

he dawbes the Pavement and Walls thereof with clay, conected with Lees of Oyl. That also

Moths may not eat his clothes,

he be sprinkles them with Lees of Oyl: as also that

Seed, Corn, lying in the fields may be kept from erosion by Animals,

if it be steeped in Oyl lees, as also Whetstones, Shoes, Brazen-vessels from rust, all Wooden-household-stuff, Potters-vessels and the like. The same *Cato* also saith,

That Myrtle branches may be preserved with their Berries on, in Lees of Oyl.

Bind these or any of the like Nature into bundles, put them into a vessel of Oyl-lees, so that the Oyl cover them, then cover the vessel. *Didymus* saith,

That roses may be kept in Oyl-lees

fresh and vigorous, if they be covered over with this liquor.

If you would preserve Figtree-branches with their fruits in Oyl-lees,

bundle them up with their leaves and all, and put them in a vessel of Oyl-lees, as we said of Myrtle; but if you would keep dry Figs from corruption, lay them up in a Potters vessel wet with Lees of Oyl decocted.

Olives may be preserved in Oyl,

for when they have lost their colour they may be gathered with their stalks preserved in Oyl, and a year after they will represent their green colour; and if you besprinkle them with common salt they will pass for new ones.

CHAP. XIII.

How Apples may be long conserved in Sawdust with leafs and Chaff or straw.

THE Ancients have invented many Trees, whose fruits may be long preserved in their own saw dust because of its dryness. Now every fruit is best kept in its own leaves dust, and the like, as we have said of Olives which are best kept in Oyl, Grapes in wine, &c.

Oranges may be kept in Cedar-dust.

As *Palladius* asserts, who avers that many have experienced it, in the like manner;

Quinces may be long kept in dust,

because as *Democritus* avers the dryness of the dust preserves them from putrefaction, they may be also kept long in Wooll, fine Tow, or the like in Chests.

The fruits of the Fir-tree may be long kept in dust.

Many diffuse the saw-dust of the Poplar, or Fir-tree, amongst their fruits for their preservation. *Apuleius* saith, You may lay them involved in fine Tow into a vineous basket, and they will keep.

Pomegranates may be kept from putrefaction in Oak-dust.

Columella would have the dust first steeped in vinegar, and then they laid in it. *Macrobius* would have us first strew a new potters vessel with the dust, then lay in the apples, then strew another layer of dust, and another of apples, till the vessel be full, which we must shut and dawb close up. *Boetius* would have the dust first infused in vinegar.

Grapes may be kept in dust.

Some keep green Grapes in dry poplar, or firre-dust. *Didymus* would have them reposed in boxes overlaid with pitch, in the dry dust of the pitch or black poplar-tree. some preserve fruits in chaff, which by its innate frigidity, either keeps the frosty rigor unmelted, or by its genuine dryness keeps all things from putrefaction; or by being void of all qualities keeps fruits in their proper quality. And first

Oranges may be kept in Chaff,

As *Palladius* avers, or in small straw. And the same saith, That

Quinces may be preserved in Chaff.

As also in small straw, as *Pliny* attests, who asserts also, That

Apples may be kept in Chaff,

or straw, they being laid upon and in it. *Palladius* saith, That

Pears will keep long in Chaff, and Medlars also,

if they be gathered on a clear day, half covered with chaff, and not again touched *Palladius* saith, That

Pomegranates may be kept in Chaff,

if they be not moved, or touched after their reposure.

Grapes may be kept in Chaff.

The clusters should be severally laid along the pavement, so that they touch not each other, with lupin-straw under them if possible, for it is dryer and hardest, and an enemy to Mice; but if not then Bean-straw, or such pulse: but if none of these, then dry hay cut small. *Palladius* saith, That

Nuts will keep in straw,

if Almonds cannot be easily excoiated, cover them with chaff and straw, and you may effect it. *Sotion* avers, That

Onions may be kept from putrefaction in Barley-straw.

First put them into hot-water, dry them in the Sun, that done, lay them so in straw that they touch not each other. *Palladius* saith, That

Chestnuts may be preserved

in small Barley-straw, or in their own leas: As also

Quinces in Fig-leaves.

Demo-

Democritus would have them involved in leaves, and sawed up with clay. *Palladius* saith, Apples may be kept from putrefaction in fig-leaves, who also avers,

That Oranges may be preserved,

in their own leaves, if they be laid severally. He also saith,

That Apples may be kept long in nut-leaves,

And *Apuleius* saith, Their colour, odour, and grace; will be hereby preserved, and that best if they be layed in fresh, not falling leaves: As also

That pears may be kept well in walnut-leaves.

Democritus saith, The leaves must be dry, and the pears will be green at a years end. *Pliny* saith,

Figs may be kept in the leaves of Vervine without putrefaction.

Palladius would have them put in an Oven, and whilst hot imposed in their own leaves and reconded in a pot. *Columella* would have dry Figs cast into a pitched vessel with dry hay in it and upon them. We may also

Preserve Cherries in the leaves of Winter-savory,

if we first cast the leaves, then the Cherries into a vessel, and so by course, or if we after the same manner lay Cherries in Reeds-leaves: thus also

May Jusubees be kept in their own leaves,

or else they may be cut of with their boughs and suspended. Thus also

May the Myrtle and its Berries be preserved,

either in a close vessel, or in Lees of Oyl. Thus also may

Quince-pears be long kept in their own leaves, and Nuts in their leaves, but the leaves must be dry, Wheat may be kept in herbs.

Tarentinus would have it imposed upon dry Wormwood and Semper-vive; but dry Quince leaves and small sand are better, which must be layed in layers among the Grain. It is best to cover the flore with Coniza, add after ten measures of Grain, to lay another layer of Coniza till all be deposed; for thus the whole will not be onely free from putrefaction for many years, but keep its due weight.

Barley may be kept safe in dry Bay-leaves,

Dry Grasse with Mint mixed with Bran, preserve Barley special well. Some bray cummin and salt together, and make them into dry Masses for the preservation of Barley.

CHAP. XIV.

How fruits may be mixed with many things for their better preservation.

And now that we may not further protract our speech, we shall from ancient Examples shew how fruits by immersion into several things, may be long kept from putrefaction: and first

Oranges in Barley putrefie not,

But if you lay them on hot Barley-bread, they putrefie quickly. *Palladius* saith,

That Quinces laid in Miller-seed, endure long,

for he thinks that Miller-seed corrupts not in many years, and so what is reposed in it cannot speedily putrefie. *Democritus* saith, Barley is better, being dry; but always provided that they be not laid near tender and fugacious fruits;

for they will vitiate them by their acid sapour, and putrefie grapes if they be near them.

Apples may be also kept in the same seed,

As *Pliny* is of mind. But *Apuleius* saith a heap of Barley is better. But you must always mind to repose each kind in its proper continent and place, because if divers kinds be occluded together, they vitiate sooner: wherefore the wine that is expressed out of several kinds of grapes, is not so firm as the simple and sincere.

Pears will keep amongst corn,

For as *Palladius* saith, The Siccity thereof is notably preservative.

Mushrooms may be kept in Millet-seed.

The *Vesuvians* also keep them in dry sand, till new ones come.

Pomegranates may be kept lay in Wheat,

if they be first dipped into hot waters, then reconded in Wheat, till they become rugous. *Varro* and *Cato* would have them put in a heap of sand for preservation. *Dydimus* saith,

That Grapes may be kept well and long,

if they be suspended in a Garner, for the dust that rises up of the corn when moved, causes long duration in grapes.

How Corn may be long preserved,

Tarentinus saith, The ashes of Oaks; others dry Beasts dung, strowed on corn preserve it; but small sand subacted with Lees of Oyl is better, for this corrupts all vermine and keeps the corn more dense and solid. Perfrigerated Argil is best of all, for it will keep corn thirty or forty years from corruption, you may let it through a strait seive when you use it.

Pulse will keep long,

if they be sprinkled with vinegar mixed with the juice of *Laser*.

CHAP. XV.

How other things may be preserved from putrefaction.

WE shall here recite what other things, though vile, may be preserved, and so make way for further inquisitions.

Quick-silver will preserve all things from putrefaction.

As fruits and the like, for we have often put fruits into a fit vessel, and cast quick-silver upon them, and so preserved them long and well.

Flesh hanged on a Brasen-nail will keep long,

For Brasis is so Rypical and exicative, that the flesh it passes thorow putrefies not.

How a dead Carcase may be preserved.

First let the side of the Body be opened, and the Carcase exenterated; let the Skull be opened and the brains taken out, let the papills be substracted, as also the privities with the pith of the Back-bone, then hang up the Body by the feet for three or four hours, then wash it with a sponge dipped in vinegar and *agna vita*, then let it dry, which done, strow it with unquenched Lime, Aloome and Salt; let it hang so two days in the smoak of Myrrhe, Bay, Rosemary, and Cypress in a dry and open place. Then make a mixture of unquenched Lime five pound, of burnt

Aloome

Aloome one pound, good Salt two pound, of Aloes and Myrrhe half a pound, of Aloes-wood half a pound, of the Oyl of Spicknard three ounces, of the powder of Rosemary-flowers five, of burnt Green-brais and Calcanthum two, of the best Theriack four, of the dust of Cypress half a pound, of dried Saffron one ounce, of the seeds of Coloquintida three and a half, of Antimony beaten to powder one and an half, of the ashes of Wine-lees five and a half, of Musk half a dragm, of Amber two. Let all be diligently brayed and mixed together, and strowed upon the Body which must be for three days together strongly rubbed, in an open and dry place. This also we admonish, that in fat Bodies the fat of the Abdomen, Buttocks, Hips, Muscles of the Leggs, thighs; and all other places must be first abstracted.

Things may be also preserved by Balsom.

But seeing we can compass no true Balsom; or if there be any, it is exceeding dear we are glad to make artificial Balsoms, as we shall shew in due place.

CHAP. XVI.

How divers sorts of Bread may be made.

WE have spoken of preserving fruits and other things: It remains to shew how we may use those we have kept. Amongst the rest, we shall teach you concerning those things that are most necessary for dayly use, as for many kinds of Bread, Wine, Vinegar, and Oyls; that not onely the Household may provide for his family with small cost: but when provision is dear, he may provide for himself with small pains in Mountains and Desarts, of all those things almost we have spoken of. But we will begin with Bread, and see what our fore-fathers used in case of necessity. I shall let pass those common things, as Spilt, and Bean-corn, Amel-corn, Typh-wheat, Panick, Selsamum; being all well known. But first

To make Bread of Wall-nuts,

Dioscorides saith there is a kind of Thistle commonly found in the waters, that onely in Rivers brings forth a certain seed as big as a Chef-nut, with three points, membranous, full of white pith, that tastes like Chef-nuts; they call them water chef-nuts vulgarly, and the Inhabitants use them in meats, as they do Chef-nuts. Pilgrims make Chapelets of them. The *Thracians* that dwell by the River Strimon, fat their horses with this Thistle when it is green, and of the same seed they make Bread to eat. Moreover, in places where they grow amongst us, the Inhabitants when provision is dear make Bread of them; as at *Ferrara* they do of Chef-nuts, and the *Bruttii* roast them in the embers and eat them for juncates. Almost in the same manner.

To make Bread of the Lote tree.

Theophrastus teacheth it. The Lote-tree grows in plain ground, where the Countreies are overflowed with water. The fruit is like a Bean naturally, but lets and more slender. That which grows on the head comes forth promiscuously, as Beans do many and very thick together: When the Sun sets, it closeth, and opens when he riseth, and springs up above the water. The head is as great as a Poppy-head, where it grows in *Euphrates*. The Egyptians lay those heads on heaps to putrefie; and when the shells are putrefied, they wash them in a River, and part the fruit from them, and dry it, and break it and make bread of it, and eat it. *Pliny*, There is also bread made of the seed of it, like to Millet seed, in Egypt by the Shepherds, and they knead it with water especially, or with milk. They say that nothing is more wholesome than that bread, or lighter whilst it is hot, but cold it is harder to digest and becomes heavy. It is certain, that those who live upon that are never troubled with Dysenteries, Tensismus, or any diseases of the belly. And therefore it is one of their remedies. For it was of old a custom;

To make bread of Dates,

which *Pliny* writes of, Dates that are very dry of Thebes and Arabia, that are slender and very lean, with a continual vapour they are terrified, and are covered rather with a Shell than a Skin. In Ethiopia it is crumbled (so great is the draught) and like meal it is made into bread.

Bread of the Mulberry-figtree.

In Caria and Rhodes there is a great Fig of Egypt, or increase of the Sycamore-tree, and in the neighbouring places where there is little wheat, the people for want of corn use it for bread, and for all bread corn. So great and continual plenty is there of that Apple, and abundance of bread is made of it pleasing to the stomach; but it affords but little nutriment, and we might make the same if we would. We find it in Writers of husbandry,

How we may make bread without leaven,

Out of *Didymus* some adde Nitre, for Nitre makes bread more crumbly, as it doth flesh also. Some the day before they make their bread, cast Grapes into the water, and the next day when they will make their bread they take them away, for they swim above the water, and they press them out, and use the moisture pressed forth for leaven, and so they make their bread more pleasing. If you would have leaven last you all the year, when the new wine hath boiled in the vessels, Skim off the froth that boils on the top, and mingle with it Millet-meal, and work it well together, and make morsels of it, which dry in the Sun, and lay up in a moist place; and you may take a sufficient quantity and use it for leaven.

CHAP. XVII.

Diuers sorts of Bread made of Roots and fruits.

NOW we shall proceed to other kinds of bread, found out in our days, that are no small profit to us when corn is dear.

How to make bread of the Roots of Cuckow-pint,

the root of Wake-Robin, when it is not too acrimonious is eaten and desired in meats. *Dioscorides* saith, The decoction was drank, as not being over sharp. *Galen*, That it was eaten as Rape-roots, and in some Countries it grows more corrodng. To prepare it rightly, pour out the water of the first boyling, and presently cast it into other hot water. In Cyrene those Roots are otherwise then amongst us, for there it is no Physical root, and is not acrimonious at all, so that it is more profitable then a Rape-root. Also our forefathers, when Corn was dear used this Root in meats with great profit. *Casus de bello civili*, Also there is a kind of Root, found by them that were with *Valerius*, which is called Chara, which mingled with milk relieved a Souldier that was hungry, and it was made up like to bread. There was great plenty of this Root, and of it bread was made, when those of *Pompey* his side objected to our Souldiers that they wanted food, they would commonly throw these at them, that they might deceive their expectation. And a little after the Army used this and were very healthful. And in *Dioscorides* in the false names of simples, Cuckow-pint was of old called Chara, with us it is so acrimonious that we scarce can endure to touch it with our tongues. But I shall open the reason how excellent bread may be made of it, and if I may say so, better then Wheat-bread. The great Roots are made clean, and they are cut into small thin plates, for the thinner they are cut, the sooner will they become pleasant, and they must boil in vessels of hot water, until you perceive the water grow sharp and the Roots somewhat sweet; pour out the former water, and pour in fresh, then

then boil them again, till the water become sweet, and the root when it is chewed hath no acrimony left. Then take them out of the water, and put them upon linnen cloths, extended and hanging up until they be dry, then grind them in hand-mills and the meal will be exceeding white, which by it self a third part of wheat-meal added to it, will make most pure bread and well tasted: There are other ways to make it sooner; when you have obtained this art, you will be exceeding glad I am very certain of it. For with great pleasure

Bread of Asphodils is eaten.

This is so fruitful of round-heads with us, that no Plant hath more, for oftentimes 80 heads will be heaped together. Moreover, Mountains and Sea-shores are full of them, that it may be truly thought to be made for mans meat. *Pliny*, The *Asphodil* is eaten with the seed and head terrified. But this roasted in the embers as *Hesiod* affirms, is eaten with oyle also braied with figs, it is eaten with great pleasure. These Round-heads are like to Navews of moderate bigness. So saith *Galen* also. But with us they are so unpleasant, and acrimonious in taste, that a man cannot eat them; and Sows digging them up with their snouts, will hardly feed on them, no nor when we want corn can we eat this in our greatest hunger, it was the poor fair of frugal antiquity. But by boiling, the sharpness of it becomes more mild, and the heat of it more tolerable, as we said of *Cuckow-pint*. It will be sufficient to satiate a mans hunger, as of old it was used: As *Pliny* saith, We have made most wholesome bread of them mingled with meal, especially for men wasted and in consumptions, also

Bread is made of Rape-roots, Turneps, and Skirwotts.

For of those boild and cooked, first cleansed from all excrements, a most commendable bread may be made, as I have tried: But meal must be mingled with them to a third part, or else half as much of one, and the other as we shall shew a little after. And not to be tedious, the same way-bread to eat, may be made of all Navews, Roots, or Bulbous-heads. Also there is made

Excellent bread of Gourds,

For Gourds may be had very cheap, and they make savoury bread with meal, and so the bread is greater, for this is the greatest of all fruits; for with a very little meal in time of Famine we may feed many men, and not onely use it for need, but for dainties also: for seasoned with Sugar, and prepared for mens pallats, and to quench feaverish heats, they are carried about every where to be sold. The way to make them up is this, Take great round Gourds, and fully ripe, and cut into many pieces the dry skin, and the pith must be taken from them with a knife; put them into a kettle of boiling water, and boil them, for by long boiling the grassy greenness, and the rank smell and loathsome taste are taken away, and they will smell better and taste, and nourish better, and will last as long as bread. Being now brought to the form of an ointment, press it through a linnen strainer with your hands, that if any parts of it be not well boiled or any woddy pieces be there, they may be kept back by the narrowness of the strainer. To this Mass, adde a third part of meal, and make them into bread together, which will be pleasant to eat daily, I will not have you to eat your fill of it, but if you eat it moderately it will profit much. When it is new it is excellent, but stale, it is not so slightly nor dainty. I have shew'd you the way how you must use such things of superfluous moisture, now do you learn wisely to do it.

CHAP. XVIII.

Divers ways to make bread of all sorts of Corn and Pulse.

ANciently they made Bread of divers kinds of Corn and Pulse, it would be needless to repeat them, for you may find them in the Books of the Antients, and here can be no error in making them. In *Campania* very sweet bread is made of Millet: Also the people of *Sarmatia* are chiefly fed with this bread, and with the raw meal tempered with Mares-milk, or blood drawn out of the veins of their legs. The Ethiopians know no other Corn then Millet and Barley. Some parts of France use Panick, but chiefly Aquitane: But *Italy* about *Po*, adde Beans to it, without which they make nothing. The people of *Pomus* prefer no meat before Panick. Panick meal now adays is neglected by us and out of use, for it is dry and of small nourishment; of Millet bread and cakes are made, but they are heavy and hard of digestion and clammy to eat. Unless they be eaten presently when they are newly baked, or hot, else they become heavy and compact together. Of the *Indian Mais*, heavy bread is made and not pleasant at all, very dry and earthy next to Millet: like to this is bread called *Exfergo*, that is also void of nutrimental juice. There was also of old bread called *Ornidos*, made of a certain seed of *Ethiopia*, so like *Sesamum* that it is hard to know them aunder. Also

Bread is made of Lupins,

The best kind was known also to the Antients; For *Didymus* teacheth how Lupins will grow sweet, being three days infused in River or sea-water, and when they grow mild they must be dried and laid aside, and then the meal of them mingled with Barley-meal or Wheat-meal is fit to make bread. But we make it thus, First the Lupins are ground in mills, and are made into flower: fifty pound of these are put into a wooden vessel, and fair water is cast upon them, that it may swim four fingers breadth above them; and it must be often stirred with a wooden stick, then let it settle till the water grow clear, and the meal sink down, then strain the water well, that no meal be lost; and pour on water the second time, and stir it as before; do so the third time till the meal and water be come sweet, which will be done in one day if the water be often changed. As that is done, put the meal into a linnen cloth laid abroad, that the meal may be seperated with a wooden slice, and the water may run away through the cloth, and the meal may dry the better upon the cloth. In the mean time boil two pound of Rice, and being boil'd mingle them with the Lupins, divide the whole into two parts, and mingle one with the leaven and a hundred pound of wheat-meal, and make bread of it; let the other be set by with the leaven till the next day, which being mingled again with wheat-meal, will make excellent bread, and will not taste of Lupins. But you must use all diligence in the making of it, for if you make it not of the best meal, the bread will be naught, wherefore the work lies in the right preparation of it: For the worse Corn or Pulse you make it of, the more Corn must be taken to prepare it. After this manner it may be made of Tares and Vetches, and the savour of them is dulcified with water and mingling meal with them. Bread is made also of Peas, Chiches, Taries, Lentils, Beans, and chiefly of Acorns. But it is not unprofitable to make

Bread of Herbs,

If a man cut the Herb Clot-bur small and grind it in a mill to very fine powder; and adde as much or a third part of wheat-meal to it, it will make good bread, that may be eaten when there is a famine; and I have heard that the poor eat it in some places, and it hurts them not, and that some in a siege have lived a moneth with such bread.

CHAP.

CHAP. XIX.

How bread may be increased in weight.

NOW I shall shew how bread may be augmented; a thing very strange and profitable, not onely to help in time of need, but it is good for the Householder, for with little meal he may nourish many, and fill their bellies; and that three ways: For there be things that added to Corn, will increase the substance of the bread; other things are dry, and of a clammy nature, that will thicken the Element by refraction into the substance of bread. The last way is the life of the heat of it, whereby it waxes and grows as if it were alive. As much as is lost by the bran taken from it, is added to it, by casting water on it when it is ground, and in the other workmanship. Moreover, the baking of bread takes away a tenth part and a half of the weight. Let us see how our Ancestors did by some Earth or

Chalk make their bread more weighty and white.

Pliny teacheth that Spelt will grow white by a kind of chalk, thus. Let this Spelt be of Beer-corn, which he called a seed; the corns of it are bruised in a wooden mortar, for it will be spoiled and consumed by the hardness of a stone: the best as it is well known, is made by those that are condemned to bray in mortars for their punishment. For the best there is an iron box, the hulls being then beaten off; again, with the same instruments the marrow of it being made bare, is broken; so are there made three kinds of this Spelt-meal, the finest, the second sort, and the third that is the coarsest. But yet they are not white, which makes them excellent, yet now are these preserved at *Alexandria*; after this, (it is very strange) chalk is mingled with them, that passes both into the body and the colour of them, and makes them tender. You shall find this between *Pueoli* and *Naples*, on the Hill called *Leucogaeum*. And there is extant a decree of *Drom Angulum*, wherein he commanded to pay them at *Naples* yearly 20000 *Sestertia* out of his Treasury, drawing his Colony to *Capua*, and he assigns the cause, by reason that they of *Campania* affirmed that Spelt-meal could not be made without that stone.

Rice makes bread weigh.

It neither corrupts the taste or goodness of the bread, but increaseth both, and it brings it closer by one eighth part, for by a continual turning it, it will retaineth volatril meal; and from hence you shall see it coagulate, and when it is coagulated put leaven to it; but it must first grow cold, lest the force of the coagulation should be hindered. To binde this fugitive servant fast, adde so much Wheat-meal as may fasten it well together, till you see there is enough, and you shall find it increased to the weight desired. By this example

You may increase the weight of bread with Millet.

This is easily done, for it is dry, crumbles, and will not hang together, and is weak; let it be bruised with a wooden pottle, and sifted through a sieve till the hulls be parted, as we see it done at *Rome* and at *Florence*; by this we hold it, that it fly not away by its hungry drincks; then we mingle it with Wheat and the air reflects back, and it will be converted into the substance of Alica, that you will think nothing taken from the taste, colour or goodness, nor yet added to it. Nor will it be unpleasant to see

Bread weigh more by adding milk to it.

This is an experiment of great profit and praise-worthy; for it adds weight and whiteness

whiteneffe to bread, and makes it short, being put in instead of water whilst it is hot. I never tasted any thing more pleasant or tender. I thought fit to addethis for the singular vertue of it, adding also such things as we knew to be necessary for this art. But truly that is admirable, by the same

Wheat to increase the weight of Wheat.

This is done without any addition, for if we would, we could do this with many and almost infinite things, with any small addition; but in this a leaven is drawn forth of the very substance of the Wheat, which being strained, cleansed and added to the same again, either by increasing the substance of it, or by retracting the air into its substance, it will be much augmented: giving you this warning before-hand, that the augmenting heat must not be diminished, but preserved and increased, that all may depend on this. But an admirable work of Nature, and full of wonder it is, how it may be that

Wheat may increase out of it self.

I cannot discover this, how it came into my mind, lest it should be made publike to every common fellow, and ignorant Animal. Yet not to conceal it from ingenious men, I shall hide it from these, and open it to those. That our forefathers knew it not is clear, because there is no such thing mentioned in all their works of making bread. The whole business consists in this, that the Wheat-meal may be managed with the life of its heat, which is the off-spring of celestial fire. By nature it is of such tenuity, that being raised with its heat, it will make the lump swell so much, that it will come up to the top of the vessel; the next day cast it into a Hurch, and adde more meal to it, which again being raised by its heat, and coming back again by the same, and meeting with the lump, as flowing back again, it joins into the refracted Elements, and so into clotters of meal. Do this thrice or four times, and so you may increase it continually, and this must be done in a stove, that the dewy spirit may be fostered. I thought good to tell you also before, that you must not prick the lump, lest the generative blast should breath forth, and flie into the air, for so you will lose your labour; and there must not want presently a dewy vapour, which being carried into the air, and made to drop, may moisten the lump, so you will rejoice at the wonderful increase: but you must be cunning in the manual application. Pray do not destroy by your negligence, what was invented by the careful ingenuity of those that tried it.

CHAP. XX.

How we may long endure hunger and thirst.

THe Ancients had some compositions to drive away hunger and thirst, and they were very necessary both in times of Famine, and in wars. *Pliny* saith, some things being but tasted, will abate hunger and thirst, and preserve our forces, as Bortier, Licoris, Hippace; and elsewhere, *Scythia* first produced that root which is called *Scythia*, and about *Bazoria* it grows very sweet. And another, that is excellent against Convulsions, also it is a high commendation of it, that such as have it in their mouths feel not hunger nor thirst; Hippace amongst them doth the same, which effects the same in horses also. And they report that with these two herbs the *Scythians* will fast twelve dayes, and live without drink also; all which he translated out of *Theophrastus* first book. The *Scythian Hippace* is sweet also, and some call it *Dulcis*; it grows by *Mazotis*. Amongst other properties, it quencheth thirst also, if it be held in the mouth. For which cause both with that

both with that, and with the other called *equestris*, men say, the *Scythians* will endure hunger and thirst twelve dayes. Hence it appears that *Pliny* translated all this out of *Theophrastus*. But I think he erred, for Hippace signifie Cheele made of Mares milk, and is no herb. *Theodorus* translated it *Equestrem*, as it were a root like *Licoris*, fit to drive away hunger and thirst. For *Hippocrates* saith, the *Scythian* shepherds eat Hippace, but that is Mares wheele: and elsewhere, The *Scythians* pour Mares milk into hollow vessels of wood and shake it, and that froths with churning, and the best of it they call butter, which swims on the top, that which is heavy sinks to the bottom, they separate this and dry it, when it is dry, they call it Hippace: the reason is, because Mares milk nourisheth exceedingly, and is as good as Cows milk. *Dioscorides*, The west Indians use another composition also

To endure hunger and thirst.

Of the herb called Tobacco, namely of the juice thereof, and the ashes of Cockle shells they make little balls and dry them in the shade, and as they travel for three or four dayes they will hold one of them between their under lip and their teeth, and thus they suck continually, and swallow down what they suck, and so all the day they feel neither hunger, thirst, nor weariness; but we will teach another composition, which *Heron* mentions, and it was called

The Epimenidian composition, to endure hunger and thirst.

For it was a medicament that nourished much, and abated thirst, and this was the food the besiegers of Cities and the besieged also lived on. It was called the *Epimenidian* composition, from the Sea-onion called *Epimenidium*, that is one of the ingredients of that composition; it was made thus, The squill was boiled and washed with water, and dried, and then cut into very small pieces, then mingle *sesamum* a fifth part, poppy a fifteneenth part, make all these up with honey, as the best to make up the mass, to mitigate it: divide the whole, as into great Olives, and take one of these about two of the clock, another about ten; and they felt no hurt by hunger, that used it. There is another composition of the same, that hath of *Athenian* *sesamum* half a Sextarius, of honey a half part, of oyle a Cotyle, and a Chance of sweet Almonds mundified: the *sesamum* and Almonds must be dried, and ground, and winowed, then the squill must have the outside taken off, and the roots and leaves must be cut into small pieces, and put into a mortar and bruised, till they be well moistened, then you must make up the squills with the like quantity of honey and of oyle, and put all into a pot, and set them in cold, and stir them well with a wooden ladle, till they be well mingled, when the lump is firm, it is good to cut it into little moriels, and he that eats one in the morning, another at night, hath meat enough. This medicament is good for an Army, for it is sweet, and so fills a man and quencherh thirst: we had this in an old scholiast, a Manuscript upon the book of *Heron*, in the Vatican Library. I saw the same composition in *Philo*, in his fifth book of wars, where he describes such like other things.

CHAP. XXI.

Of what fruits wines may be made.

NOW we shall speak of fruits, of which wines may be made. And first our Antecessors did do thus, but they had two wayes; for some were for Physicks, which are found plentifully in Physick books: others again were for ordinary use, and they were divers, and almost infinite, according as the differences of places and Nations are: for what is granted to one is denied to another. First

Wine of Dates.

Pliny saith that in the East they make wine of Dates, and he reckons up fifty kinds of Dates, and as many different wines from them; *Cariora* are the chief, full of juice, of which are made the principal wines in the East, they are naught for the head, and thence they have their name. The best are found in Judæa, chiefly about Jericho, yet those of Archelais are well esteemed, and of Phateli, and of Libia, valleys of the same Country. The chiefest property they have is this, they are full of a white fat juice, and very sweet, tasting like wine with honey. The wine will make one drunk, and the fruit also eaten largely. *Dioscorides* teacheth thus; Put ripe Dates called Chydeæ, into a pitcher with a hole at bottom, and stop with a pitched reed; shut the hole with linnen, and to fourty Sextarii pour on three gallons of water. If you would not have it so sweet, five gallons will be sufficient to pour on; after ten dayes take away the reed with the linnen, take the thick sweet wine and set it up. Also wine is made

Of Figs.

Sotion relates it thus. Some make wine of green figs, filling half the vessel with them, and the other half to the brim they fill with fair water, and they try still by tasting, for when it tastes like wine, they strain it and use it. It is made saith *Dioscorides*, of ripe figs, and it is called Catorchites or Syctes, Chelidenian or Phœnician figs called Caricæ, are steeped in a pot with a hole in the bottom with a pitched reed, and the hole stop with flax: to fourty Sextarii you must pour on three gallons of water, and if you will not have the wine so sweet, pour on five gallons and it will do. After ten dayes the liquor is taken, and again the third time also the same measure of water wherein the figs were infused, is poured on; and in the like manner, after four or five dayes it is drawn off. Some to fix Amphoræ thereof adde ten Sextarii of salt, that it may not early corrupt; others put Fennel and Thyme in the bottom, and the Caricæ on the top, and so in order, till the vessel be full: also men make

Wine of Pears,

which from the Greek word for Pears is called *Appres*, and from the Latin *Piery* *Palladius* saith it was thus. They are bruised and put in a very coarse bag of Canvas, and pressed with weights, or in a Press. It lasts in the Winter, but in Summer comes it sower. *Dioscorides* will not have the Pears too ripe; the same way is made

Wine of Pomegranates.

Sotion makes wine of the grains of the Pomegranate, taking away what is in the middle of the grains. *Palladius* put the ripe grains well purged into a Date pail, and presst them out with a scrue press, then boil them gently to half; when it is cold, put it into vessels that are pitched or plastered with Gypsum. Some do not boil the juice, but to every Sextarius they mingle one pound of honey, and put all in the said vessels and keep it. There is made

Wine of the Lote-tree fruit.

There is a kind of Lote without any inward kernel, which is as hard as a bone in the other kind: wine is pressed also out of it like Mead, that will not last above ten dayes; *Nepos* saith the same from *Pliny*, *Athenam* from *Polybim*. Wine is made of the Lote steeped in water and bruised, very pleasant to the taste as the best Mead is; it is drunk pure without water also, but it will not last above ten dayes, wherefore they make but little for use to last onely so long. Vineger is made also of it. And yet not much or good enough, yet there is made

Wine of Myrtle-berries and Cornelis,

ONE

Of increasing of Household-stuffe.

Our of *Sotion*, who of the berries of Myrtles and Cornelis when they are fresh, pounded and pressed out, made wine. Now I shall shew how we may make

Wine of Corn.

Drink is made of Corn. *Dioscorides* teacheth to make Beer of Barley, also a drink is made of Barley called *Curni*, they use that drink oft-times for wine; the like drinks are wont to be made of Wheat. In Hiberia toward the west and in Britany; whence *Pliny*, of Corn drink is made: Beer in Egypt, called Zythum, in Spain *Cælia* and *Ceria*, Beer in France and other Provinces. In *Aristotles* book of drum-kennels, those that drink wine made of Barley till they be drunk fall upon their backs, they call that wine *apra*, but those that are drunk with any other kind of drinks fall any way, on the right or left hand, forward or backward, but those that drink *Pisum*, fall onely upon their backs. Wine made of Barley they call *Brytum*. *Sophocles* in *Triptolemo*, and *Æchylus* in *Lycurgo*. But *Hellanicus* saith, that *Brytum* is made in Farms out of roots. *Hecatemus* saith, that the Egyptians grinde Barley to make drink, and that the Macedonians drink *Brytum* made of Barley, and Parabia made of Millet, and Rice, saith *Athenam*. Also wine is made of Rice; for saith *Ælianum*, when an Elephant fights in war, they give him not onely wine of grapes, but of Rice also. Now the same drink is made in the Northern Climates of Corn, and they call it Biera, but they put hops to it, for it cannot be made without; Barley and Wheat are infused in the decoction of it. We see that of Barley and Wheat steeped in water a drink is made that tastes like wine, and of them I have made the best *aqua vite*. But these drinks of old were Physical, rather then to use as wine. But I shall shew how some drinks that are so like wine in taste, that you would think they were wine indeed. And first

Wine of Honey.

To nine vessels of water put eighteen pounds of Honey, into brasse Caldrons covered with Tin, and let them boil a long time, stirring all with wooden lades, and wiping away the froth that riseth with little brushes, pour it out, & put it into a wine vessel, then take two pounds of red wine Tartar, and boil them in water till they be dissolved, to which add an eighth part of a vessel of vineger, that the loathsome and unpleasing taste of the sweetness of Honey may be lost, let these be mingled; then pour on two vessels of the best wine, then let it settle; after some dayes strain it through a hair-cloth strainer, or one of cloth to cleanse it from the filth and excrements. A liquor will run from this that will serve for sparing, and to abate charge in a family, and it is good to drink in health and sickness: cover it close, and drink it. I shall shew you another way to make

Wine of Raisins.

Pour into a brasse Caldron seven vessels of water, put in two pounds of Raisins, let them boil till they be wasted in the water, and the water be sweet as Mead; if your kittle be too small, do it at several times: then take your kittle from the fire, and when the liquor grows cold, strain it gently forth; put up the strained liquor in a wine vessel, and pour into it a measure of the sharpest red wine vineger to abate the sweetness of the Raisins, then add nine pound of Tartar finely powdered unto it, and pouring on a fourth part of the best wine, stop the vessel close when it is full, after one week use it. Another

Wine of Quinces.

Put into brasse Caldrons glazed with Tin a vessel of new wine, and put thereto about fifty wild Quinces, namely such as are full of streaks and wrinkled, take out their kernels, cut the Quinces in peices like as you do Rape Roots, boil all at a gentle fire; when they have boild a while, take them off, and let them cool, pound the Quinces in a mortar with a wooden pestle, press them out with a press, put the juice pressed forth of them the new wine, and set it up in a glazed earthen vessel for a whole year. When wine is scarce and you have occasion to use this, put
into

Into a vessel four parts of water, two of new wine, and one fourth part of the aforesaid mixture, cover the vessel and let it boil, and when it is clear, straine it. Of all these an amphora of vinegar, a pound of honey, as much Tartar in powder, let them boil a while in a pot glazed with Nitre, and mingle them, and for every vessel of water pour on an Amphora of wine, and cover all, and after twenty dayes use it: or take honey one pound, as much red wine Tartar, half a pound of Raisins, two Amphoras of Vinegar, let them boil in a pot, adde wine also to them, and it will be for drink. I shall adde the Northern drink

Wine called Metheglin.

The drink in Pannonia, Poland and England is more pleasant and wholesome then many wines are; it is made of twenty pound of good honey, and of water one hundred and twenty pound, skimming it till all comes to eighty pound, which being cold and tunned up into a wine vessel, put in leaven of bread six ounces, or as much as will serve to make it work, and purifie it self, and withal put into a bag, that hangs and may be put into the liquor, and not touch the bottom, of Cinnamon, granes of Paradise, Pepper, Ginger, Cloves two drams, one hand full of Elder flowers: let them stand in a wine Cellar all the Winter, in Summer let them forty dayes in the Sun, till they taste like wine, and the unpleasant taste of the honey be gone. But it will be more pleasant if you add a third part of wine.

CHAP. XXII.

How vinegar may be made divers wayes, and of what.

After wine it follows to speak of vinegar: First, how our forefathers made it; then how of late years, that it may be made extreame sower, which is not only good for a family, but necessary for many Arts. Also there are some Countries where wine, and so vinegar is scarce. Therefore in those places divers men have used their wits to make it: wherefore to begin, we say that

Vinegar may be made of the Fig-tree.

Out of *Columella*; A green fig must be taken very betimes, and also if it have rained, and the figs fall to the earth beaten down with showres, gather those figs and put them up in Hogs-heads or Amphora, and let them ferment there; then when it grows sharp, and hath sent out some liquor, what vinegar there is strain it out diligently, and pour it into a sweet pitched vessel. This yields the best sharp vinegar, and it will never grow musty or hoary, if it be not set in too moist a place. Some to make more quantity, mingle water with the figs, and then they adde to them the ripest new figs, and they let them consume in that liquor, until it taste sharp enough like vinegar, then they strain all through rusby baskets, or withie bags; and they boil this vinegar till they have taken off all the froth, and filth from it. Then they adde some terrefied salt, and that hinders worms and other vermine to breed in it. *Cassianus* makes it thus: Put into a vessel old figs, terrefied Barley, and the internal parts of Citrons. Sit it often and diligently, and when they are putrified and soaked, strain them out, and use them. *Apuleius*, They make vinegar of figs, wet upon the Trees, and cast into water to putrifie, *Dioscorides*, The liquor of figs steeped grows sharp as vinegar, and is used for it. There is made also

Vinegar of Dates.

To Date wine we speak of, some adde water, and receive it again; and they do this three, four, five or six times, and at last it grows sower. From the same, *Pliny* teacheth to make

Vinegar of honey.

You must wash your honey vessels, or hives in water, with this decoction is made the most wholesome vinegar. *Palladius* teacheth the way to make

Vinegar

Vinegar of Pears.

wild Pears are such as are sharp and ripe, are kept three dayes in a heap, then they are put into a vessel, and fountain or river water is put to them, the vessel is left covered thirty dayes, then as much vinegar as is taken out for use, so much water is put in to repair it. *Cassianus* makes

Vinegar of Peaches.

Put soft delicate Peaches into a vessel, and adde parched Barley to them, let them putrifie for one day, then strain them out, and use it. We may from *Cassianus* make

Vinegar without wine.

If you boil Gypsum and sea-water, and then mingle it with River water, and use it being strained. But if you will

Turn wine into vinegar, and contrarily vinegar into wine.

Cassianus hath it. He puts Beet roots bruised into wine, it will be vinegar when three hours are over. But if he would restore it again as it was, he puts in Cabbage roots. So also

To make the same.

We may do it another way and quickly: Cast into wine, Salt, Pepper and sower leaven, mingle them and they will soon make it vinegar. But to do it more quickly quench in it often a red hot brick or piece of steel; also provide for that unrripe Medlars, Cornels, Mulberries and Plums. But *Sotion* shews to make

Sharp vinegar of new wine.

Dry the mother of wine of grapes at the Sun, and put them into new wine, adding a few sower grapes thereto and it will make sharp vinegar that will be for use after seven dayes. or put in pellitory of Spain and it will be sharp. Moreover, if you boil a fourth or fifth part of vinegar at the fire, & put that to the rest, and let all eight dayes in the Sun, you shall have most sharp and pleasant wine. The roots of old grass, and Raisins, and the leaves of a wild Pear-tree bruised, and the root of the bramble, and whey of milk, burnt Acorns, Prunes roasted, and the decoctions of Chiches, and pot-theards red hot, all of these put severally into vinegar, will make it tart. *Apuleius* teacheth

To double the quantity of vinegar.

Take a good measure of Vinegar, about a Metreta, and to that adde one Metreta of Sea-water boiled to half, mingle them and set them aside in a vessel. Some steep Barley, and strain it, and of that juice they mingle one Metreta, and they stir them together, and they cast in torrefied salt when it is yet hot, a good quantity, then they cover the vessel, and let it stand eight dayes. But use to make it thus,

Vinegar of clusters of grapes pressed forth.

After the Vintage, we cast in the clusters when the wine is pressed forth into a wooden vessel, and we pour upon them a quantity of water, and it will be vinegar when a week is over. Moreover we cut the tendrils from Vines, and bruise them, and put water to them, and it will be vinegar. Also thus,

Ill wine is turned to vinegar.

When the bunches of grapes are pressed forth, lay them between two wooden bowls, not very thick together, let them grow hot for four dayes; then pour on them so much naughty wine as may cover them, let them alone 24 hours, then strain them into another wooden bowl, and after so many hours, put them into another bowl, and do so till it be turned into most sharp white vinegar, and if you would make more of the same clusters, pour on upon them some sharp vinegar, and let them alone till they be extreame sharp and sower, then take that out and pour on ill wine, and do as you did: Lastly press those clusters out in a press, and you shall recover as great quantity as of the wine that was spent.

CHAP.

CHAP. XXIII.

How the defects of wine may be managed and restored.

Our forefathers found out many remedies to preserve wine, and in our dayes we have taken no less pains. For wine is easily corrupted, and takes to it self many strange qualities. *Paxamus* saith, wine either grows sower or dead about the Solstices, and when the seven stars set, or when the dog star causeth heat, and when it is extreame cold, or hot, or rainy, or windy, or when it thunders. We shall shew remedies for all these; First, we shall lay down out of *Africanus*, the signs to know wines that will last, or will corrupt. When you have put your wine into a vessel, after some time change the vessel, and look well on the Lees, for thence shall you know what the wine is, proving it by smelling to it, whether it corrupt, or weevils breed in it, these are signs it putrefies. Others take wine out of the middle of the vessel, they heat it, and when it is cold they taste of it, and they judge of the wine by the savour, some by the smell of the cover; a strong taste is the best sign, a watry the worst, sharpness of duration, weakness of corrupting. The signs must be taken at the times to be feared, we mentioned. But to come to the remedies, we shall shew how

To mend weak wine.

The wine will be weak, when it begins to breath forth that force of heat; for when the foul of it is breathed forth, the wine grows immediately sower: vinegar is the carcasie of wine. Then we may presently prevent it by adding *aqua vita* to it, for by that it may put on a new soul: the measure will be the fourth part of a pound for a vessel. Another remedy will be

That wine may not grow hot.

In the Summer Solstice wine grows hot by the hot weather, and is spoiled: then put quick-silver into a glasse well stopp'd, and hang it in the middle of the vessel, and the coldness of it will keep the wine from heating. The quantity is two pound for great vessels; for when the air is hot, the external heat draws forth the inward heat, and when that is gone, it is spoiled. We

That wine may not exhale.

use this remedy. The vessel being full, we pour oyle upon it, and cover it, for oyle keeps the spirits from evaporating, which I see is now used for all liquors that they may not be perverted. Wines sometimes are troubled: But

To clear wines,

Fronto bids us do thus. Cast three whites of egges into a large earthen dish and beat them, that they may froth; put some white salt to them, that they may be exceeding white, and pour them into a vessel full of wine, for salt and the white of an egge will make all thick liquors clear, but as many *Dolia* or such measures as there are in the vessel, so many whites of egges must you have, to be mingled again with so many ounces of salt, but you must stir the mixture with a stick, and in four dayes it will grow clear. Alho it is done

That wines may not corrupt.

I said that salt keeps all things from corrupting: wherefore for every *Dolium*, powder one ounce of Allome, and put it into the wine vessel with the wine, for it will keep it from corrupting. The same is done if you put in one ounce of common salt, or half one, half the other: Alho brimstone hinders purefaction. Wherefore if you shall adde to eight ounces of Allome or of salt

Salt, four ounces of brimstone, you shall do well. The Antients were wont to preserve wine, by adding Salt or sea-water to it, and it would continue along time. *Columella* teacheth thus, when the winds are quiet you must take water out of the deep sea: when it is very calm, and boyl it to thirds, adding to it, if you please, some spices. There are many ordinary things, but we let them pass.

CHAP. XXIV.

How Oyl may be made of divers things.

It is an excellent thing to shew the diversity of ways to make Oyl. That if Olives should ever be scarce, yet we might know how to draw Oyl from many kinds of fruits and seeds. And some of these ways that came from the Antients, yet onely the best and such as are our inventions. Wherefore to begin, We say that

Oyl may be made of Ricinu, call'd Cicinum.

Dioscorides makes it thus. Let ripe Ricini as many as you please, wither in the hot Sun, and be laid upon hurdles: let them be so long in the Sun, till the outward shell break and fall off. Take the flesh of them and bruise it in a mortar diligently, then put it into a Caldron glazed with Tin that is full of water: put fire under and boil them, and when they have yielded their inbred joyce, take the vessel from the fire, and with a shell skim off the Oyl on the top, and keep it. But in Egypt where the custom of it is more common: for they cleanse the Ricini and put them into a Mill, and being well grownd, they press them in a press through a basket. *Pliny* saith, They must be boiled in water, and the Oyl that swims on the top must be taken off. But in Egypt where there is plenty of it, without fire, and water sprinkled with Salt, it is ill for to eat, but good for Candles. But we collected them in September, for then is the time to gather them, with it parts from a prickly cover and a coat that holds the seed in it; it is easily cleansed in a hot Caldron: The weight of Oyl is half as much as the seed, but it must be twice knocked, and twice pressed. *Palladius* sheweth how

Oyl of Mastick is made,

gather many Grains of the Mastick-tree, and let them lye in a heap for a day and a night: Then put a basket full of those Berries into any vessel, and pouring hot water thereto, tread them and press them forth. Then from that humour that runs forth of them, the Oyl of Mastick that swims on the top is poured off. But remember lest the cold might hold it there, to pour hot water often on. For thus we see it made with us, and all the Country of Surrenum: also, so is made

Oyl of Turpentine,

as *Damageron* teacheth. The fruit of Turpentine is grownd in a Mill, as the Olives are, and is pressed out, and so it sends forth Oyl. The kernels serve to feed hogs and to burn. Likewise

Oyl of Bays,

Boil Bay-berries in water, the shels yield a certain fat, it is forced out by crushing them in the hands, then gather the Oyl into horns. *Palladius* almost as *Dioscorides*, in January boyl many Bay-berries, that are ripe and full, in hot water, and when they have boyld long, the watry oyl that swims on the top that comes

from them, you shall gently pour off into vessels, driving it easily with feathers. The Indians make as it is said

Oyl of Sesamon.

It is made as we said before, it sends forth excellent Oyl abundantly. There is made

Oyl of the Plane-Tree.

Pliny, For want sometimes they are forced to make Oyl for candles, of the Plane-tree berries soaked in water and salt, but it is very little as I proved. *Pliny* saith the Indians make

Oyl of Chest-nuts,

which I think very difficult, for but a little will come from them, as you shall find if you try. He said also, That *Gallia Cisalpina* made

Oyl of Acorns of the Oak

to serve for lights; but we can make very little. Also the Ancients used to make

Oyl of Walnuts,

that they pressed from the Walnuts, unflavoury and of a heavy taste: for if there be any rottenness in the kernel, the whole manner is spoil'd. Now *Gallia Cisalpina* makes it for to eat, and for lights also. For lights, by parting the naughty Nuts from the sound; but the best serves for to eat at second courses. These therefore are to eat, and those for lights, they burn clear, and there is nothing that yields more Oyl. For it turns almost all to Oyl, for one pound of cleansed Nuts will yield almost ten ounces of Oyl. Now follows

Oyl of sweet Almonds.

Oyl of sweet Almonds is best for food, and of bitter, for Physick, and of old it was made with great diligence. *Dioscorides* shews the way how half a bushel of bitter Nuts cleansed and dried, are pounded in a mortar with a wooden pestle into lumps, then a sextarius of seething water is poured on, and when for half an hour the moisture is drunk in, they are beaten more violently then before; then is it pressed between boards, and what sticks to the fingers is collected with shells. The Nuts being pressed again, a Hemina of water is sprinkled on them, and when they have drank that up, they do as before; every bushel yields an Hemina. With us it is commonly drawn out the same way. These are the Oyls of the Ancients. Now we shall proceed with our Oyls: Next follows

Oyl of small Nuts.

They yield abundance of sweet sented excellent Oyl, which all may use also for meats: one pound of the cleansed Nuts will yield eight ounces of Oyl, which former times were ignorant of.

Oyl of Pistaches

serve for Meat and Physicks. Out of

Pine kernels Oyl is made

They are cull'd, and the naughty ones serve for lights; but the Oyl that comes from the best, is for to eat, and for Physick; very much is extracted. I saw it at Ravenna. But

Oyl of Beech,

the best of all is pressed out in abundance, for meats and for lights. It burns very clear, and tastes as sweet Almonds, and the whole Nut almost goes into Oyl,

as

as the Wallnut doth. The elder the Mast is, the more Oyl it yields, and the Lees of the Oyl is excellent to fat Oxen and Hogs. They are soon gathered, cleaned, bruised and pressed: We pressed also

Oyl from the bastard Sycomore,

as they call it; for it is abundant in seed, and in winter the boughs of it are seen loaded with seed only. In February we collected it and crumbled it, the shell is broken into six or seven parts, the kernels are like a Pear, they are bruised and heated in a pan, then put into a press, and they yield their Oyl: They make clear light in lamps, and the seed yields a fourth part of Oyl. There is drawn

Oyl out of the Sanguine Tree

for lights. About the middle of September the ripe berries are taken forth of the clusters, let them dry a few days, bruise them, and let them boyl in water in a brais bottle for one hour, then put them into the press, you shall have green coloured Oyl, about a seventh part of the seed. The Mountainous people use it. There is pressed

Oyl out of the Grapes or Raisins,

The Greeks call'd these Gigarta: *Cisalpina Gallia* makes oyl of them, bruised, heat, and pressed in a press, but it is very little fit for lights, because it burns exceeding clear. There is much in Egypt

Oyl of Radish-seed

made: they use it to season their meats, and boil it with them. But *Cisalpina Gallia* presseth Oyl out of Radish-seed, and Rape-seed: Rapes are pulled up onely in November, but they are covered with sand together with their leaves. They are planted in March, that they may seed in May. For unless they be pulled up, they freeze with winter cold. But there is another kind of Rape that is sowed in July; it is weeded, it comes forth in the spring, in May it yields seed: out of a quarter of a bushel of it, eighteen pounds of Oyl are drawn; it is good for lights, and for common people to eat. If you sow a whole Acre with this seed, you shall have five load of seed, and of every load you may make two hundred pounds of Oyl: it is onely plow'd and weeded. Also

Oyl is made of the seed of Cameline.

It is made for lights, but those of Lombardy make great plenty of a golden-coloured Oyl of a seed like to this, called Dradella. It hath plained leaves as wild Roher, which they sowe amongst Pulic. The same may be said of the seeds of Nettles, Mustard, Flax, Rice.

CHAP. XXV.

How a Householder may provide himself with many sorts of Thread.

Now shall I speak of many sorts of Yarn, because this may much help the Household, for the Housewife hath always need thereof. Our Ancestors used Hemp and Flax; for thus they made

Turn of Flax:

yet there needs no example, the Thread is so common. I will speak of those that follow, and of other inventions. *Pliny*. Flax is known to be ripe two ways, when the seed smells, or looks yellow; then it is pulled up and bound in handfuls, and dried in the Sun, letting it hang with the roots upwards for one day: Then five of these bundles standing with their tops one against another, that the seed may fall in the middle. Then after Wheat-harvest,

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the branches are laid in the water that is warm with the Sun, they are kept down by some weight and soaked there, and again, as before, turn'd up-side down they are dried in the Sun. Then being dried, they are bruised on with a flax-hammer; that which was next the rind is call'd hard, or the worst flax, and it is fit for to make wicks for Candles, yet that is kemmaed with hackes, till all the membrans be pill'd clean. The art of kemmaing and making of it, is, out of fifty pound of Flax-bundles, to make fifteen pound of Flax. Then again it is polished in Thread, it is often beat upon a hard Stone with water, and when it is woven it is bruised again with Beetles, and the more you beat it, the better it is. Also there is made

Thread of Hemp,

Hemp is excellent for ropes. Hemp is plucked up after the Vintage, but it is cleaned and pill'd with great labour. There are three sorts of it, that next the rind is the worst, and that next the pith, the middlemost is the best, which is called *Mesla*: Another

To make Thread of Broom,

It is broken and pull'd from the Ides of May, until the Ides in June, this is the time when it is ripe. When it is pull'd, the bundles are set in heaps for two days to take the wind; on the third day it is opened and spread in the Sun, and is dried, and then again it is brought into the house in bundles. Afterwards it is well steep'd in sea-water, or other water where that is wanting. Then being dried in the Sun again, it is watered, if we have presently need of it, if it be wet with hot water in a vessel, it will be the shorter way. But it must be heat to make it good, for the fresh nor sea-water cannot soften it enough. Ropes of Hemp are preferred when they are dry, but Broom is preferred wet, to make good the dryness of the ground it grows on. The upper part of Egypt toward *Arabia*, makes linnen of Cotten. *Assa* makes Flax of Spanish Broom, especially for Fishers nets to last long; the Shrub must be soaked for ten days. And so every Country hath its Thread made of divers Plants and Shrubs. We know that there is made

Thread of Nettles,

amongst the Northern people, and it is very fine and white: also there is made

Thread of Aloes in America,

it is hard, white, and most perfect. I shall describe it by their relation, because the extreame parts are full of prickles, we strike them off that they may not hinder us, and we cut the branches into long pieces long ways, that the substance under the rind may be the better taken away; then two Poles of wood are fastned in the earth, crossing one the other in the middle like a cross; these are held fast with the left hand, to make them hold fast together, and with the right the foresaid pieces or fillets are taken by one end and drawn over the cross, that the inward part may part from the woody part, and the Flax from the substance, and then they are kemmaed so often, till they become white, pure, nervous, as Fiddle or Harp-strings, then are they washed, dried, and laid up. In thirteen years after that it is planted, the leaves grow very long even twenty foot, the stalk riseth in the middle forty foot long. Then the top is adorned with flowers and bears fruit: I saw this at Rome, and I never remember that I saw any thing more beautiful. I shall now speak of Flax call'd *Asbestinum*. *Pliny* saith there is Flax also found, That fire will not consume; they call it live-Flax, and I have seen Napkins and Table-clothes burping in the fire, at Feasts, and they were better cleansed of filth with the fire, then they could be by water: Wherefore of this they made Coats for Kings funerals, to keep the ashes of the Body from other ashes. It grows in India in the desarts and scorched places with the Sun, where no rain falls; but there are terrible creatures and serpents, and this is preserved by burning; it is hard to be found, and difficult to wear, because it is so short: when it is found it is as dear as the most precious Pearls. The Greeks call it *Asbestinum* from the nature of it, *Sol* saith *Pliny*, out of which words it is plain that he

he knew not the Stone *Asbestinum*, when he said that it was hard to find, and difficult to wear for the shortness of it, for it is kemmaed and spun by every woman almost, if she be not ignorant of it, as I saw at Venice, a woman of Cyprus and another of Valencia, that showed me it in great abundance in the Arsenal Hospital. It is an excellent secret, very rare and profitable, though few knew it of our times: but I have freely communicated it, though it cannot be had, but at great rates.

CHAP. XXVI.

To hatch Eggs with out a Hen.

NOW shall I shew how without a Hen, Eggs of Hens and other Birds may be hatcht in summer or winter, so that if any sick people desire to eat Chickens then, they may have them. Bird Eggs are hatcht with heat, either of the same Bird, or of others, as the heat of man, of the Sun, or fire; for I have seen Hens sit on Geese, Ducks, and Peacocks Eggs, and Pigeons sit on Hen Eggs, and a Cuckoo sit upon any of them. And I have seen women to foster and hatch Eggs between their breasts in their bosoms, and under their arm-pits. *Livia Augusta* when she was young and great with child of *Nero*, by *Cesar Tiberius*, because the earnestly desired to bring first a boy, she made use of this Omen to try it by, for she fostered an Egg in her bosom, and when the male lay it aside, she put it into her nurses bosom, that the heat might not abate, *Pliny*. But *Aristotle* saith that Bird Eggs, and Eggs of forefooted Beasts are ripened by the incubation of the dam; for all these lay in the earth, and their Eggs are hatcht by the warmth of the earth. For if forefooted Beasts that lay Eggs came often where they are, that is more to preserve and keep them then otherwise. And again, Eggs are hatcht by sitting. It is Nature's way, but Eggs are not onely so hatcht, but of their own accord in the earth, as in Egypt covered with dung they will bring Chickens, *Diodorus Siculus de Egyptis*. Some are found out by mans industry, by those that keep Birds and Geese; besides the ways that others have to produce them, that they may have Birds that are strange, and great numbers of them: for Birds do not sit upon their Eggs, but they by their skill hatch the Eggs themselves. At *Syracuse* a certain drunken companion put Eggs under the earth in mats, and he would not leave off drinking till the Eggs were hatcht. In Egypt about grand *Cairo*, Eggs are artificially hatcht; they make an Oven with many holes, into which they put Eggs of divers kinds, as Goose eggs, Hen Eggs, and of other Birds; they cover the Oven with hot dung, and if need be they make a fire round about it, so are the Eggs hatcht at their due times. *Pandus Jovius* in his Book of his Histories. In Egypt there is abundance of Hen Chickens: For Hens do not there sit on their Eggs, but they are hatcht in Ovens by a gentle heat, that by a an admirable and compendious art, Chickens are hatcht in very few days and bred up, which they sell not by tale, but by measure. They make the measure without a bottom, and when it is full they take it away. And in the Island of Malta in Sicily, they make an Oven, where into they put Eggs of divers Fowls, as of Hens, Geese, then they make a fire round about, and the Eggs grow ripe at times. But let us see how our Ancestors hatcht their Eggs, *Democritus* teacheth

If a Hen do not sit, how she may have many Chickens,

The day you set your Hen upon Eggs, take Hens dung, pound it and sift it, and put it into a hollow vessel with a great belly, lay Hens feathers round about. Then lay your Eggs upright in it, so that the sharp end may be uppermost; and then of the same dung, sprinkle so much on them till the Eggs be covered. But when your Eggs have lain so covered for two or three days, turn them afterwards every day, let not one touch the other, that they may heat alike. But after the twenty day when the Chickens begin to be hatcht, you shall find those that are in the bottom to be crackt round, for this reason you must write down the day they were set, let you mistake the time: Wherefore on the twentieth day, taking of the shell, put the Chickens into a pen and be tender of them. Bring a Hen to them which is best to order

it: yet I tried this most diligently, and it took no effect, nor can I tell how it should be done. They that commend the Oven, do not teach the manner how it should be done. But what I have done myself, and I have seen others do, I shall briefly relate, that with little labour and without Hens, any one may

Hatch Eggs in a hot Oven.

Make a vessel of Wood like a Hoghead, let it be round, and the Diameter so long as your arm is, that you thrust in, that you may lay and turn the Eggs, let it be four foot in Altitude. This we divide by three boards within into four parts: Let the first be a foot and half, the second little above a foot, the third a foot, and the fourth least of all. Let every concavity divided with boards have a little door thereto, so large as you may thrust in your arm, and its shut to open and shut at pleasure. Let the first and second loft be made of thin boards, or wrought with twigs, let the third be of brags arched, and the fourth of solid wood. Let the first and second stage have a hole in the centre three fingers broad, through which must pass a brazen or iron pipe tinned over, that must come half a foot above the second story, and so in the lower most, but in the bottom the orifice must be wider, like a Pyramid or funnel, that it can safely receive the heat of the flame of a candle put under it; in the second story let the pipe be perforated about the top, that the heat breathing forth thence, the place may be kept warm, and the Eggs may be hot in the upper part, as they are under the Hen. Above these three rooms throw saw-dust, which I thinks is best to cover them: Let the saw-dust be highest about the sides of the Hoghead, but less in the middle; in the bottom where the pipe is lower, that the Eggs that lie upon it may receive the heat that comes from the pipe every way: In the third story where the pipe ends, let it be pressed down about the sides, and higher in the middle about the pipe, let a linnen cloth cover the saw-dust, a fine cloth, that if it be soiled it may be washed again, and the Chicken hatcht may go upon it. Lay upon every story a hundred Eggs, more or less, let the great end of the Eggs lye downwards, the sharp end upwards. The walls of the Hoghead that are above the saw-dust within the concavities, and the upper part of the story must be covered with sheep skins, that their warmth may keep in the heat: In the lower concavity under the Tunnel, must a light lamp be placed, at first with two weicks, in the end with three, in summer; but at beginning of winter, first with three, and last with four or five: Let the light fall upon the middle of the Tunnel, that the heat ascending by the pipe, the rooms may heat all alike. The place where this vessel stands must be warm and stand in a by place; in the lower part where the lamp is lighted, you must lay no Eggs, for that heat there will not hatch them. But where the Chickens are wet when they are first hatcht, shut them in here to dry them by the warm heat of the lamp, marking twice or thrice every day whether the heat abate, be warm or very hot. We shall know it thus, take an Egg out of the place, and lay it on your Eye, for that will try it well: if it be too hot for you, the heat is great, if you feel it not, it is weak; a strong heat will hatch them, but a weak will make them addle. So you must addle or take away from your lamp, to make the light adequate & proportionable after the fourth day that the Eggs begin to be warmed, take them out of the cells, and not shaking them hard, hold them gently against the Sun beams or light of a candle, and see whether they be not addle, for if you discern any fibres or bloody matter run about the Egg, it is good; but if it be clear and transparent, it is naught, put another Egg in the place of it: All that are good must be daily turned at the lamp heat, and turn them round as the Hen is wont to do. We need not fear spoiling the Eggs, or if any man do handle them gently; in summer after nineteen or twenty days, or in winter after twenty five or twenty eight days, you shall take the Eggs in your hand, and hold them against the Sun, and see how the Chickens beak stands, there break the shell, and by the hole of the Egg take the Chicken by the beak and pull out its head; then lay it in its place again, for the Chicken will come forth it self, and when it is come out, put it in the lower cell as I said: But let the lamp stand something from the pavement, lest the Chickens allured by the light, should pick at it and be burnt by it: And if you do

work

work diligently as I have shewed you, in three hundred Eggs you shall hardly lose ten or twenty at most. But because they are hatcht without the dam, I must shew how to make

A Cock foster Chickens as the Hen doth,

For they would die, if none did keep them. But a Cock or Capon will perform what the Hen should; do but shew him the Chicken, and stroke him gently on the back, and give him meat out of your hands often, that he may become tame. Then pull the feathers off of his breast, and rub him with Nettles, for in a few hours, not to say days, he will take care of the Chickens so well and give them their meat, that no Hen did ever do it, as he will.



THE

THE
FIFTH BOOK
OF

Natural Magick :

Which treateth of Alchymy; shewing how Metals
may be altered and transformed, one into another.

THE PROEME.

WE are now come (according to that order which we proposed unto our selves in the beginning) to those experiments which are commonly called by the name of Alchymy matters, wherein not onely a great part of the world is much conversant, but also every one is very desirous to be a practitioner in them, and doth thirst after them with an unquenchable lust. Wherefore we are constrained to speak something concerning this Subject the rather, because many rude and unskilful men, being drawn on, partly by the hope of gain, which they looked for by it, and partly by the pleasure and delight which they did take in it, have bestowed themselves in these experiments to the great slander both of the Art it self, and also of the professors thereof; so that now adays, a man cannot handle it without the scorn and obloquy of the world, because of the disgrace and contempt, which those idiots have brought upon it. For whilst they, being altogether ignorant of the Principles of these things, have labored to make sophistical and counterfeit gold, they have utterly miscarried in their endeavours, and wasted all their substance, and quite undone themselves, and so were deluded by that vain hope of Gold, which set them on work. Demetrius Phalereus said very well of these men, That which they should have gotten, saith he, they did not get; and that which they had in their own possession, they lost; and so, whereas they hoped to work a metamorphosis or alteration in the Metals, the alteration and change hath lighted heavily upon themselves, in respect of their own estate: and when they have thus overthrowen themselves, they have no other comfort left them but onely this, to brag many lies and counterfeit devices, whereby they may likewise deceive others, and draw them into the very same lurches which themselves have before fallen into. And surely the desire partly of the Art it self, and partly of the great gain which many men hoped after by the same, hath filled the world with so many Books, and such an infinite number of lies, that there is scarce any other matter in the like request; so that it was very well done of Dioclesian the Emperour, and it was high time for him so to do, to establish a Decree, that all such lying Books that were written concerning that matter, should be cast into the fire and burnt to ashes. Thus was an excellent good Art discredited and disgraced by reason that they abused it; which falls out also in many other better things then this. The Art of it self is not to be set at naught, but rather to be embraced and much to be sought after; especially by such as apply their minds to Philosophy, and to the searching out of the secrettes of Nature: for they shall find in it many things which they will wonder at, and such as are exceeding necessary for the use of men: and when they shall behold the experience of many kinds of transmutations and sundry effects, it will be no small delight unto them; and besides, it will shew them the way to profounder and worthier matters, such as the best and soundest Philosophers have not been ashamed to search into, and to handle in their writings. I do not here promise any golden mountain, as they say, nor yet that Philosophers stone, which the world hath so great an opinion of, and hath been bragged of in many ages, and happily attained unto by some; neither yet do I promise here that golden liquor, whereof if any man do drink, it is supposed that it will make him to be immortal; but it is a meer dream, for seeing that the world it self is variable and subject to alteration, therefore it cannot be but that whatsoever the world yields, (should likewise be subject to destruction; so that to promise or to undertake

Of Changing Metals.

take any such matters as these are, it were but rashness and meer foolishness. But the things which we purpose to discourse of and to deliver, are these which hereafter follow; and I would request the Readers to take them in good part, and to content themselves with these; lest if they attempt to proceed to further experiments herein, they prove themselves as foolish and as mad as those which we have spoken of before. These things which here you shall find, I my self have seen, and proved by experience, and therefore I am the bolder to set them abroad to the view of the whole world.

CHAP. I.

Of Tin, and how it may be converted into a more excellent Metall.



Inne doth counterfeit and resemble Silver; and there is great amity and agreement betwixt these two Metalls in respect of their colour. The Nature and the colour of Tinne is such, that it will whiten all other Metalls; but it makes them brittle and easie to be knapt in sunder: onely Lead is free from this power of Tinne: but he that can skilfully make a medley of this Metall with others, may thereby attain to many pretty secrettes. Wherefore, we will endeavor to counterfeit Silver as neer as we can: A matter which may be easily effected, if we can tell how to abolish and utterly destroy those imperfections which are found in Tinne, whereby it is to be discerned from Silver. The imperfections are these: First, it is wont to make a creaking noise, and crasheth more then Silver doth: Secondly, it doth not ring so pleasantly as Silver, but hath a duller sound: Thirdly, it is of a more pale and wann colour: And lastly, it is more soft and tender; for if it be put into the fire, it is not first red hot before it be melted, as Silver will be; but it clings fast to the fire, and is soon overcome and molten by the heat thereof. These are the qualities that are observed to be in Tinne; not the essential properties of the Nature thereof, but onely accidental qualities, and therefore they may be more easily expelled out of their subject. Let us see therefore how we may rid away these extrinsecal accidents: and first,

How to remedy the softness of Tin, and the creaking noise that it makes.

You must first beat it into small powder, as you shall hereafter be instructed in the manner how to do it; and when you have so done, you must reduce it into one whole body again. And if it do not lose its softness at the first time as you deal so by it, use the same course the second time, and so likewise the third time rather then fail, and by this means you shall at length obtain your purpose: for, by so doing, the Tin will wax so hard, that it will endure the fire till it be red hot, before ever it will melt. By the like practice we may also harden all other soft bodies, to make them red hot before they shall be melted: but the experience hereof is more clear in Tinne then in any other Metalls whatsoever. We may also take away the creaking noise of Tinne, if we melt it seven several times, and quench it every time in the urine of children; or else in the Oyl of Wall-nuts: for this is the onely means to expel that quality and imperfection out of it. Thus then we have declared the manner how to extract these accidents from it: but all this while we have not shewed how it may be transformed into Silver: which now we are to speak of, as soon as ever we have shewed the manner

How to bring Tin into Powder,

which we promised to teach. Let your Tinne boil in the fire; and when it is very liquid, pour it forth into a great mortar; and when it beginneth to wax cold, and to be congealed together again, you must stir it and turn it round about with a wooden pestle, and let it not stand still in any case; thus shall you cause it be congealed into very small crums as little as dust: and when you have so done, put it into a very fine ranging sieve, and sift out the smallest of it; and that which is left

behinde in your sieve, because it is too great and not broken well enough, you must put it into the fire again, and use the very same course with it to break it into smaller dust, as you used before; for unless it be thoroughly broken into powder, it is not serviceable, nor fit for your purpose. Having therefore shewed you how to break your Tin into small crums, as also how to expel out of it those imperfections whereby it is most manifestly discerned from Silver; both which things are very necessary preparatives as it were to the main matter which we have in hand, let us now come to the principal experiment it self, namely

How to alter and transform Tin, that it may become Silver,

You must take an earthen vessel somewhat wide-mouthed; but it must be very strongly and firmly made, that it be thoroughly able to endure the vehemency of the fire, even to be red hot: Into this vessel put your Tin broken into such small crums as have been spoken of, and therein you must with an iron ladle stirre it up and down continually without ceasing, till it be all on a light fire, and yet none of the Metal to be melted: when you have so done, that you have given it over, and it gathereth together into one body or lump again, you must below the very same labour upon it the second time, so long as it may stand in small crums all on a fire for the space of six hours together, without melting. But if some part of the Metal be melted by the vehement heat of the fire, and some other part of it remain not melted, then you must take away that which is melted, and when it is congealed, you must break it into small powder once again, and you must run over your whole labour again with it, even in the same vessel and with the same instrument as before. After this, when you have brought all your Metal to that perfection that it will endure the fire without melting, then you must put it into a glass-furnace where glass is wont to be made, or else into some Oven that is made of purpose to reflex the heat of the fire to the best advantage, and there let it be tormented and applied with a very great fire for the space of three or four days together, until such time as it is made perfectly white as snow: for the smaller that it is broken and beaten into powder, the more perfectly it will take white, and be the fitter for your purpose, and more exactly satisfy your expectation. After all this, you must put it into a vessel that shall be almost full of vinegar, and the vinegar must cover all the Tinne, and swim about three inches above it. There you must distill it, and let the vinegar boil with it so long, till the Tinne hath coloured it, and made it of his own hue, and thickened it into a more gross substance. Then let it stand a while; and when it is thoroughly settled, pour out that vinegar and put in new, and temper it well with those ashes or crums of Tinne: and this you must do again and again, till all your Tinne be dissolved into the vinegar. If by this often repetition of this labour, you cannot effect such a dissolution, then you must put it once again to the fire in such a furnace, or else into such an Oven as we spoke of before, that so it may be reduced into white ashes more exactly and perfectly, whereby it may be the more easily dissolved into vinegar. After this, you must let the vapour of the vinegar be exhaled, and strained out, and the Tinne that is left behinde must be put into a certain vessel where ashes have been wont to be put, and then melt some fine Lead and put amongst it: and because the Lead that is put in will bear up the Tinne aloft, therefore you must make certain little balls or pills compounded of Soap and Lime, or else of Salt-peter and Brimstone, or some other like fat earthy stuff, and cast them in amongst the Lead and Tinne, and they will cause the Tinne to drench it self with the Lead: and by this means, all your Tinne that doth rake the Lead, and is incorporated into it by a just proportion and equal temperature, doth become very excellent good Silver. But this is a marvellous hard labour, and not to be achieved without very great difficulty. You may like wise alter and transform

Tinne into Lead,

An easie matter for any man to effect, by reducing Tinne into ashes or powder often times: for the often burning of it will cause the creaking noise which it is wont to make, to be voided from it, and so to become Lead without any more

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ado; especially, if you use a convenient fire, when you go about to reduce it into powder.

CHAP. II.

Of Lead, and how it may be converted into another Metal.

The Ancient Writers that have been conversant in the Natures of Metals, are wont to call Tinne by the name of white Lead; and Lead, by the name of black Tinne: insinuating thereby the affinity of the Natures of these two Metals, that they are very like each to another, and therefore may very easily be one of them transformed into the other. It is no hard matter therefore, as to change Tinne into Lead, which we have spoken of in the former Chapter, So also

To change Lead into Tinne.

It may be effected onely by bare washing of it: for if you bath or wash Lead often times, that is, if you often melt it, so that the dull and earthy substance of it be abolished, it will become Tinne very easily: for the same quick-silver, whereby the Lead was first made a subtil and pure substance, before it contracted that soil and earthiness which makes it so heavy, doth still remain in the Lead, as Gebruus hath observed; and this is it which causeth that creaking and gnashing sound, which Tinne is wont to yield, and whereby it is especially discerned from Lead: so that when the Lead hath lost its own earthy lumpishness, which is expelled by often melting; and when it is endued with the sound of Tinne, which the quick-silver doth easily work into it, there can be no difference put betwixt them; but that the Lead is become Tin. It is also possible to transform

Antimony into Lead:

For, that kind of Antimony which the Alchymists are wont to call by the name of Regulus, if it be oftentimes burned in the fire, and be first thoroughly boiled, it runneth into Lead. This experiment is observed by *Discherides*, who saith, That if you take Antimony and burn it exceedingly in the fire, it is converted into Lead. *Galen* sheweth another experiment concerning Lead, namely,

How to procure Lead to become heavier, then of it self it is:

For, whereas he had found by his experience, that Lead hath in it self an aethereal or airy substance, he brings this experiment. Of all the Metals, saith he, that I have been acquainted with, only Lead is increased both in bigness and also in weight, for, if you lay it up in cellars or such other places of receipt that are under the ground, wherein there is a turbulent and gross foggy air, so that whatsoever is laid up in such rooms shall straightways gather filth and soil, it will be greater and weightier then before it was. Yea, even the very clamps of Lead which have been fastened into carved Images to knit their parts more strongly together, especially those that have been fastened about their feet, have been divers times found to have waxed bigger; and some of those clamps have been seen to swell so much, that whereas in the making of such Images the leaden plates and pins were made level with the Images themselves, yet afterwards they have been so swollen, as that they have stood forth like hillocks and knobs very unevenly, out of the Chrystal stones whereof the Images were made. This Lead, is a Metal that hath in it great store of quick-silver, as may appear by this, because it is a very easie matter,

To extract Quick-silver out of Lead.

Let your Lead be filed into very small dust, and to every two pounds of Lead thus beaten into powder, you must put one ounce of Salt-Peter, and one ounce of ordinary common Salt, and one ounce of Antimony. Let all these be well beaten and powned together, and put into a sieve; and when they are well sifted, put them in-

to a vessel made of glass, and you must fence and plaister the glass round about on the outward side with thick loam tempered with chopt straw, and it must be laid on very fast; and that it may stick upon the vessel the better, your glass must not be smooth, but full of rigoles, as if it were wrested or writhen. When your vessel is thus prepared, you must settle and apply it to a reflexed fire, that is, to a fire made in such a place, as will reflect and beat back the heat of it with great vehemency to the best advantage: and underneath your vessels neck, you must place a large pan, or some other such vessel of great capacity and receipt, which must be half full of cold water: then close up all very fast and sure, and let your fire burn but a little, and give but a small heat for the space of two hours; afterward make it greater, so that the vessel may be thoroughly heated by it, even to be red hot; then set a blower on work, and let him not leave off to blow for the space of four whole hours together, and you shall see the quick-silver drop down into the vessel that is half full of water, being sighted, as it were, out of the Metall by the vehement force of the fire. Commonly the quick-silver will stick to the sides of the vessels neck, and therefore you must give the neck of the vessel a little jolt or blow with your hand, that so the quick-silver may fall downward into the water-vessel. By this practice I have extracted oftentimes out of every pound of Metall almost an whole ounce of quick-silver; yea, sometimes more than an ounce, when I have been very diligent and laborious in performing the work. Another experiment I have seen, which drew me into great admiration,

Lead converted into quick-silver:

A counterfeiting practice, which is the chief cause that all the quick-silver almost which is usually to be had, is but bastard stuff, and merely counterfeit; yet it is bought and sold for current, by reason of the near likeness that it hath with the best. Let there be one pound of Lead melted in an earthen vessel, and then put unto it also one pound of that Tinny metall which is usually called by the name of Marchasite: and when they are both melted together, you must stirre them up and down, and temper them to a perfect medley with a wooden ladle: In the mean space you must have four pounds of quick-silver warmed in another vessel standing by, to cast in upon that compounded Metall; for unless your quick-silver be warm, it will not close nor agree well with your Mettals: then temper your quick-silver and your Metall together for a while, and presently after cast it into cold water; so shall it not congeal into any hard lump, but float on the top of the water, and be very quick and lively. The onely blemish it hath, and that which onely may be excepted against it, is this, that it is somewhat pale and wan, and not all things so nimble and lively as the true quick-silver is, but is more slow and slimy, drawing as it were a tail after it, as other viscous and slimy things are wont to do. But put it into a vessel of glass, and lay it up for a while; for the longer you keep it, the quicker and nimbler it will be.

CHAP. III.

Of Brads; and how to transform it into a worthier Metall.

WE will now alledge certain experiments concerning Brads; which though they are but slight and trivial, yet we will not omit to speak of them, because we would satisfy the humour of those, who have a great desire to read of and be acquainted with such matters. And here we are to speak of such things as are good to stain the bodies of Mettals with some other colour than naturally they are endued withal. Yet I must needs confess that these are but fained and counterfeit colourings, such as will not last and stick by their bodies for ever; neither yet are they able to abide any trial, but as soon as ever they come to the touchstone, they may easily be discerned to be but counterfeits. Howbeit, as they are not greatly to be desired, because they are but deceivable, yet notwithstanding they are not utterly to be rejected as things of no value. And because there are very few Books extant which

Treat

Treat of any Argument of like kind as this is, but they are full of such experiments and sleights as here offer themselves to be handled by us (for they are very common things, and in every mans mouth) therefore we will in this place speak onely of those things which are easily to be gotten, and yet carry with them a very goodly shew, inso-much that the best and sharpest censure may be deluded and mistaken by the beautiful glos that is cast upon them; and it may grieve the quickest and skillfullest judgement, to define upon the suddain whether they are true or counterfeit. Yet let them be esteemed no better then they deserve. But this you must know, that as slight and trivial as they are, yet they require the handling of a very skilful Artificer: and whosoever thou art that goest about to practice these experiments, if thou be not a skilful and well experienced workman thy self, be sure to take the advice and counsel of those that are very good Artists in this kind; for otherwise thou wilt certainly miscarry in them, and be defeated of thy purpose. The chief and especial things which are of force to endue Brads with a whiter colour, are these: Arsenick or Oker; that kind of quick silver which is fumed, as the Alchymists call it; the scum or froth of silver, which is called by the Greeks Lithargyron; the Marchasite or fire-stone; the Lees of wine; that kind of Salt which is found in Africk under the sand, when the Moon is at the full; which is commonly called Salt Ammoniac; the common and ordinary Salt which the Arabians call by the name of Al-hali; Salt-peter, and lastly Alo-me. If you extract the liquor out of any of these, or out of all these, and when it is dissolved, put your Brads, being red hot, into it to be quenched, your Brads will become white: Or else, if you melt your Brads, and as soon as it is molten, put it into such liquor, your Brads will become white: Or else, if you draw forth into very small and thin plates, and pown those bodies we now speak of into small powder, and then cast both the brads that is to be coloured, and the bodies that must colour it, into a melting or casting vessel, and there temper them together to a good medley, and keep them a great while in the fire, that it may be thoroughly melted, the brads will become white. Or else, if you melt your brads, and then cast upon it some of that colouring in small lumps, (for if you cast it in powder and dust, it is a doubt that the force and rage of the fire will utterly consume it, so that it shall not be able to infect or stain the metall) but if you cast good store of such colouring upon the molten brads, it will endue your brads with a strange and wonderful whiteness, inso-much that it will seem to be very silver indeed. But that you may learn the better, how to work such experiments, and besides, that you may by occasion of those things which are here set down, learn how to compound and work other matters, we will now set forth unto you certain examples, how we may make

Brads to counterfeit Silver;

for when once you are trained up a little in the practice of these matters, then they will sink more easily into your understanding, then by all your reading they can do: therefore as we have spoken of such things as will do this feat, so also we will teach you how to work artificially. Take an earthen pot, and set it upon the fire with very hot coals heaped round about it; put lead into it, and when you see that your lead is molten by the force of the fire, take the third part of so much silver as there was lead, and pown it into small powder, and put it to the lead into the pot; but you must sprinkle it in onely by little and little, that it may be scorched, and even burned as it were by the heat of the fire, and may float like as it were oyle on the top and surface of the lead; and some of it may be so wasted by the vehemency of the heat, that it vanish away into the smoak. Then let them rest a while, so long as there be any remainders of the coals left. After you have so done, break the vessel into pieces, and take away the scum and dross of the metall; and whereas there will stand on the top of the metall a certain oyle as it were, or a kind of gelly, you must take that, and bray it in a mortar, and cast it into a vessel by little and little where there is brads melted; and though the brads be three times so much in weight as that gelly is, yet the gelly will endue all that brads with a white silver colour: Nay, if there be more then three times so much melted brads put into that metal, it will make it all like unto silver. But if you would have your brads endued with a per-

perfect white colour, and not discernable from silver, you must melt some silver and some brasse together, and then throw them into the fire, and so take them out again after some short time; for the longer you suffer them in the fire, the worse will your experiment succeed. Which is a matter not worthy to be observed in these cases: for if your work continue any longer in the fire then need requires, it will fade in colour, and the violence of the fire will countermand the operation and effect of your skill and labour in tempering the metals together, and so the brasse will recover his former colour in his first estate. Wherefore let your metals be kept in the fire as little while as you can, that you may make your brasse whiter; and in colour most like unto silver: howbeit, though you have made it never so white, yet in time it will wax blackish and dim again; for the Arsnick that is naturally incorporated into the brasse, will always strive to restore it to the former dusky and dim colour which it is by nature endued withal. We will now also teach you another way how to make

Brasse to counterfeit Silver;

and this is a more excellent and notable experiment then the former. Take six ounces of the Lees of wine, eight ounces of Cristall Arsnick, half an ounce of quick-silver that hath been sublimated, two ounces of Salt-peeter, one ounce and an half of glass; beat all these together in a mortar, and see that they be broken into the smallest powder and dust that may be. After this, take three pounds of Copper, that which is commonly called Banda Mediolanensis; this you must have to be drawn out into small thin and slender plates; and when you have thus prepared your metals and ingredients, you must take of that powder, and sprinkle it into an earthen pot by little and little, and withal put into the same pot your slender plates of Copper; and these things you must do by course, first putting in some of your powder, and then some of your Copper, and afterward some powder again, and afterward some of your little plates again, and so by turns one after another, till the pot be brim-full: then set a cover upon your pot, and plaister it all over singularly well with good stiffe mortar that is tempered with chopped straw; then binde it round about with bands and clamps of iron; and truss it up very hard and stiffe together, and then cover it over again with such mortar as before. Afterward let the pot be made hot with a great fire round about it. The manner of the heating of your pot must be this; set the pot in a Centre as it were, that the fire may lye as it were in the circumference round about it, to the distance of one foot from the Centre; a little after this, move you fire neerer to the pot, that there may not be above the distance of half a foot betwixt them; then within a while lay the fire a little neerer, and so by little and little let the fire be brought close to the pot, yea and let the pot be covered all over with hot burning coals, within the space of one hour, and so let it stand hidden in the fire for the space of six whole hours together. And after the six hours, you must not take away the coals, but let them go out and die of themselves, and let the pot so stand under them until it be stark cold; and when it is thoroughly cold, break it into pieces, and there you shall find your little thin plates so brittle, that if you do but touch them somewhat hard with your fingers, they will soon be crumbled into dust. When you have taken them out of the pot, you must afterward put them into some casting vessel that is very hard, and durable; and there within half an hour it will be melted: then put into it some of your powder by little and little, till all of it be molten together; then cast it all forth into some hollow place, into some form or mould, that it may run along into rods; and the metal will be as brittle and as easie to be broken into small crumbs, as any Ice can be. After all this, you must melt two pounds of brasse; but you must first purifie it and cleanse it a little, by casting upon it some broken glass, and Lees of wine, and Salt-ammoniack, and Salt-peeter, every one of them by turns, and by little and little. When you have thus cleansed it, you must put unto it one pound of that metal which you made of the Copper and powder before spoken of; and you must still sprinkle upon them some of that powder; and after all this, you must take half so much of the best silver

silver that may be gotten, and melt it amongst the metals before spoken of, and cast them all together into some hollow place like a mould, and so you shall obtain your purpose. But that the surface and the utmost out-sides of the metal may appear white, you must throw it into the fire, that it may be burning hot, and then take it forth, and cast it into that water wherein the Lees of wine and ordinary salt have been liquefied and dissolved; and there let it boil for a certain time, and so shall you make it very white, and moreover so pliant and so easie to be framed and wrought to any fashion, that you may draw it thorough any little hole, yea even thorough the eye of a needle. Furthermore, this is not to be omitted nor buried in silence, for it is a matter of great use, and special force in the colouring of metals, that they be inwardly cleansed and purged of their dross, that they may be thoroughly washed and rid of all such scum and effalls, as are incident unto them; for being thus handled, they will be more serviceable and operative for all experiments. As for example; let brasse be molten, and then quenched in vineger, and then reduced into powder with salt, so that the more gross and infectious parts thereof be extracted from it; and let it be so handled oftentimes, till there be nothing of its natural uncleanness remaining within it, and so shall it receive a deeper dye, and be changed into a more lively colour. Let the vessel wherein you melt your metals to prepare and make them fit for your turn, be bored thorough in the bottom with sundry holes, that the metal being melted may strain thorough, but the dross, and scum, and effalls of it may be left behind, that there may be nothing but pure metal to be used in your experiments: for the less dross and effalls that your metal have, they are so much the more serviceable for your use in working. Let this therefore be a general rule alwayes to be remembered and observed, that your metals be thoroughly purged and rid from their dross as much as may possibly be, before ever you entertain any of them into your service for these intendments. There is yet also another way whereby we may bring to pass that

Brasse should resemble silver,

and this by Arsnick Orpine, which is an effectual means to accomplish this matter: and whereas in tract of time the metal will somewhat recover it self to its own former paleness and dim colour, we will seek to remedy it and prevent it. Take the best Arsnick Orpine that may be gotten, such as yawns and gapes as though it had scales upon it; it must be of a very orient golden colour; you must meddle this Orpine with the dust of brasse that hath been filed from it, and put into them some Lees of wine; but they must be each of them of an equal weight and quantity when you drench them together within the liquor, and so shall it bear a continual orient colour, and glitter very brightly without ever any fading at all. After this, take you some silver, and dissolve with that kind of water which is called *Aqua-fortis*; but it must be such as hath in it very little store of moisture; for the moist waterish humour that is in it, must be evaporated in some scalding pot or other such vessel, which you must fill up to the brim six or seven several times, with the same water, after the vapours of it have been extracted by the heat of the fire that is under the vessel: when you have thus done, you must mingle your silver that is so dissolved, with the brasse filings; and the Arsnick Orpine which we spake of before; and then you must plain it and smooth it all over with the red marble-stone, that the clefts or scales before spoken of, may be closed up; and withal, you must water it by little and little, as it were drop after drop, with the oyle that hath been expressed or extracted out of the Lees of wine, or else out of the firmest Salt-ammoniack that may be had. And when the Sun is gotten up to any strength, that it shews forth it self in very hot gleams, you must bring forth this confection, and let the force of the heat work upon it, even till it be thoroughly dry: afterward you must supple it with more of the same oyle again, and then let it be dried up again so long, till that which is remaining do weigh just so much as the silver weighed before it was dissolved. Then close it up in a vessel of glass, and lay it under some dunghill till it be dissolved again, and after the dissolution be gathered together into a Gelly; then cast

cast into it ten or eight pieces of brasis, and it will colour them all, that they shall most lively counterfeit silver. But if you desire

To make brasis shew it self of a silver colour, by rubbing it betwixt your hands,

as boyes and cozening companions are oftentimes wont to do, that if they do but handle any vessels of brasis, they will make them straightways to glitter like silver, you may use this devise. Take Ammoniack-salt, and Aloome, and Salt-peeter, of each of them an equal weight, and mingle them together, and put unto them a small quantity of Silver-dust, that hath been filed off; then set them all to the fire, that they may be thoroughly hot; and when the fume or vapour is exhaled from them, that they have left reaking, make a powder of them; and whatsoever brasis you cast that powder upon, if you do withal, either wet it with your own spittle, or else by little and little rub it over with your fingers, you shall find that they will seem to be of a silver colour. But if you would whiten such brasis more handsomely and neatly, you must take another course: You must dissolve a little silver with *Aqua-fortis*, and put unto it so much Lees of wine, and as much Ammoniack-salt; let them so lie together till they be about the thickness of the filth that is rubbed off from a mans body after his sweating: then roul it up in some small round balls, and so let them wax dry: when they are dry, if you rub them with your fingers upon any brasis or other like metal, and still as you rub them moisten them with a little spittle, you shall make that which you rub upon to be very like unto silver. The very like experiment may be wrought by Quick-silver; for this hath a wonderful force in making any metal to become white. Now, whereas we promised before, to teach you, not onely how to endure brasis or such other metal with a silver colour, but also how to preserve and keep the bodies so coloured from returning to their former hiew again, you must beware that these bodies which are ended with such a silver colour, do not take hurt by any sharp or sower liquor; for either the urine, or vinegar, or the juice of limons, or any such tart and sower liquor, will cause this colour soon to fade away, and so discredit your work, and declare the colour of those metals to be false and counterfeit.

CHAP. IV.

Of Iron, and how to transform it into a more worthy metal.

NOW the order of my proceedings requires, that I should speak somewhat also concerning Iron; for this is a metal which the Wizards of India did highly esteeme, as having in it self much goodness, and being of such a temperature, that it may easily be transformed into a more worthy and excellent metal then it self is. Notwithstanding, some there are, which reject this metal as altogether unprofitable, because it is so full of gross earthly substance, and can hardly be melted in the fire, by reason of that firm and seled brimstone which is found in it. But if any man would

Change Iron into Brasis,

so that no part of the grosse and earthly substance shall remain in it, he may easily obtain his purpose by Copprisse or Virriol. It is reported that in the mountain Carpatas an Hill of Pannonia, at a certain Town called Smolinicum, there is a Lake, in which there are three channels full of water: and whatsoever Iron is put into those channels, it is converted into brasis: and if the Iron which you cast into them be in small pieces or little clamps, presently they are converted into mud or dirt; but if that mud be baked and hardened in the fire, it will be turned into perfect good brasis. But there is an artificial means whereby this also may be affected; and it is to be done on this wise. Take Iron, and put into a casting vessel; and when it is red hot with the vehement heat of the fire, and that it beginneth to melt, you must cast upon it by little and little some sprinkling of quick brimstone: then you

you must pour it forth, and cast into small rods, and beat it with hammers: it is very brittle, and will easily be broken: then dissolve it with *Aqua-fortis*, such as is compounded of virriol and Aloome tempered together: set it upon hot cinders till it boil, and be dissolved into vapours, and so quite vanish away; and the substance thereof, or the rubbish that remains behinde, if it be reduced into one solid body again, will become good brasis. If you would

Make Iron to become white,

you may effect it by divers and sundry sleights; yet let this onely device content you in this matter. First, you must cleanse and purge your Iron of that dross and refuse that is in it, and of that poysoned corruption of rust that it is generally infected withal: for it hath more earthly substance and parts in it then any other metal hath, inasmuch that if you boil it and purge it never so often, it will still of it self yield some new excrements. To cleanse and purge it this is the best way: Take some small thin plates of Iron, and make them red hot, and then quench them in strong lye and vinegar which have been boiled with ordinary Salt and Aloome; and this you must use to do with them oftentimes, till they be somewhat whitened: the fragments or scrapings also of Iron, you must pown in a mortar, after they have been steeped in salt; and you must bray them together till the salt be quite changed, so that there be no blackness left in the licour of it, and till the Iron be cleansed and purged from the dross that is in it. When you have thus prepared your Iron, you must whiten it on this manner: Make a plaister as it were of quick-silver and lead tempered together; then pown them into powder, and put that powder into an earthen vessel amongst your plates of Iron that you have prepared to be whitened: close up the vessel fast, and plaister it all over with mortar, so that there may be no breathing place for any air either to get in or out: then put it into the fire, and there let it stay for one whole day together, and at length encrease your fire, that it may be so vehement hot as to melt the Iron; for the plaister or cresson which was made of lead and Quick-silver, will work in the Iron two effects; for first, it will dispose it to melting, that it shall soon be dissolved; and secondly, it will dispose it to whitening, that it shall the sooner receive a glittering colour. After all this, draw forth your Iron into small thin plates again, and proceed the second time in the same course as before, till you find that it hath taken so much whiteness as your purpose was to endure it withal. In like manner, if you melt it in a vessel that hath holes in the bottom of it, and melt with it lead, and the Marshale or fire-stone, and Arinick, and such other things as we spake of before in our experiments of brasis, you may make Iron to become white. If you put amongst it some silver, though it be not much, it will soon resemble the colour of silver: for Iron doth easily suffer it self to be medled with gold or silver; and they may be so thoroughly incorporated into each other, that by all the rules of separation that can be used, you cannot without great labour, and very much ado separate the one of them from the other.

CHAP. V.

Of Quick-silver, and of the effects and operations thereof.

IN the next place it is meet that we speak something concerning Quick-silver, and the manifold operations thereof: wherein we will first set down certain vulgar and common congelations that it makes with other things, because many men do desire to know them; and secondly, we will shew, how it may be dissolved into water, that they which are desirous of such experiments, may be satisfied herein. First therefore we will shew

How Quick-silver may be congelated and curdled as it were with Iron;

Put the quick-silver into a casting vessel, and put together with it that water, which the Blacksmith hath used to quench his hot Iron in; and put in also among them Ammoniack Salt, and Vitriol, and Verdegrease, twice so much of every one of these, as there was quick-silver: let all these boil together in an exceeding great fire, and still turn them up and down with an Iron slice or ladle; and if at any time the water boil away, you must be sure that you have in a readines some of the same water through hot to cast into it, that it may supply the waite which the fire hath made, and yet not hinder the boiling; thus will they be congealed all together within the space of six hours. After this, you must take the congealed stuff when it is cold, and binde it up hard with your hands in leather thongs, or linnen cloth, or others, that all the juice and moisture that is in it, may be squeezed out of it; then let that which is squeezed and drained out, settle it self, and be congealed once again, till the whole confection be made: then put it into an earthen vessel well washed, and amongst it some spring-water, and take off as neer as you can, all the filth and scum that is upon it and is gone to waste; and in that vessel you must temper and diligently mix together your congealed matter with spring-water, till the whole matter be pure and clear: then lay it abroad in the open air three days and three nights, and the subject which you have wrought upon will wax thick and hard like a shell or a tile-sheard. There is also another congelation to be made with quick-silver,

Congelation of Quick-silver with balls of Brasse,

thus: make two Brasse half circles, that they may fasten one within the other, that nothing may exhale: put into them quick-silver, with an equal part of white Arsenick and Tartar well powdered and seared; lute the joynts well without, that nothing may breathe forth, so let them dry, and cover them with coles all over for six hours: then make all red hot, then take it out and open it, and you shall see it all coagulated and to stick in the hollow of the Brasse ball; strike it with a hammer, and it will fall off; melt it, and project it, and it will give an excellent colour like to Silver, and it is hard to discern it from Silver. If you will, you may mingle it with three parts of melted Brasse, and without Silver; it will be exceeding white, soft and malleable. It is also made another way: Make a great Cup of Silver, red Arsenick and Latin, with a cover that fits close, that nothing may exhale: fill this with quick-silver, and lute the joynts with the white of an Egg, or some Pine-tree-rofin, as it is commonly done: hang this into a pot full of Linseed Oyl, and let it boil twelve hours; take it out, and strain it through a skin or straw; and if any part be not coagulated, do the work again, and make it coagulate. If the vessel do coagulate it slowly, so much as you find it hath lost of its weight of the silver, Arsenick and Alchymy make that good again, for we cannot know by the weight: use it, it is wonderful that the quick-silver will draw to it self out of the vessel, and quick-silver will enter in. Now I shall shew what may be sometimes useful,

To draw water out of Quick-silver.

Make a vessel of porters earth, that will endure the fire, of which crucibles are made six foot long, and of a foot Diameter, glassed within with glass, about a foot broad at the bottom, a finger thick, narrower at the top, bigger at bottom. About the neck let there be a hole as big as ones finger, and a little pipe coming forth, by which you may fitly put in the quick-silver; on the top of the mouth let there be a glass cap, fitted with the pipe, and let it be smeered with clammy clay, and bind it above that it breathe not forth. For this work make a furnace, let it be so large at the top, that it may be fit to receive the bottom of the vessel, a foot broad and deep. You must make the grate the fire is made upon, with that art, that when need is you may draw it back on one side, and the fire may fall beneath. Set therefore the empty vessel into the furnace, and by degrees kindle the fire: Lastly, make the bottom red hot; when you see it to be so, which you may know by the top, you must look through the glass cap; presently by the hole prepared pour in ten or fifteen pounds of quick-silver, and presently with clay cast upon it stop that hole, and take

take away the grate that the fire may fall to the lower parts, and forthwith quench it with water. Then you shall see that the water of quick-silver will run forth at the nose of the cap, into the receiver under it, about an ounce in quantity: take the vessel from the fire, and pour forth the quick-silver, and do as before, and always one ounce of water will distil forth: keep this for Chymical operations. I found this the best for to smug up women with. This artifice was found to purifie quick-silver. I shall not pass over another art, no less wonderful than profitable for use,

To make quick-silver grow to be a Tree:

Dissolve silver in *aqua fortis*, what is dissolved evaporate into thin air at the fire, that there may remain at the bottom a thick unctious substance; Then distil fountain-water twice or thrice, and pour it on that thick matter, shaking it well; then let it stand a little, and pour into another glass vessel the most pure water, in which the silver is: adde to the water a pound of quick-silver, in a most transparent crystalline glass that will attract to it that silver, and in the space of a day will there spring up a most beautiful tree from the bottom, and hairy, as made of most fine beards of corn, and it will fill the whole vessel, that the eye can behold nothing more pleasant. The same is made of gold with *aqua regia*.

CHAP. VI.
Of Silver.

I shall teach how to give silver a tincture that it may shew like to pure gold; and after that, how it may be turned to true gold.

To give Silver a Gold-colour,

Burn burnt brasse with stibium, and melted with half silver; it will have the perfect colour of gold; and mingle it with gold, it will be the better colour. We boil brasse thus: I know not any one that hath taught it: you shall do it after this manner: melt brasse in a crucible, with as much stibium: when they are both melted, put in as much stibium as before, and pour it out on a plain Marble-stone, that it may cool there, and be fit to beat into plates. Then shall you make two bricks hollow, that the plates may be fitly laid in there: when you have fitted them, let them be closed fast together, and bound with iron bands, and well luted: when they are dried put them in a glass furnace, and let them stand therein a week, to burn exactly, take them out and use them. And

To tincture Silver into gold,

you must do thus: Make first such a rare lye, put quick lime into a pot, whose bottom is full of many small holes, put a piece of wood or tile-sheard upon it, then by degrees pour in the powder and hot water, and by the narrow holes at the bottom, let it drain into a clean earthen vessel under it: do this again, to make it exceeding tart. Powder stibium and put into this, that it may evaporate into the thin air; let it boil at an easie fire: for when it boils, the water will be of a purple colour: then strain it into a clean vessel through a linnen cloth; again, pour on the lye on the powders that remain, and let it boil so long at the fire, till the water seems of a bloody colour no more: Then boil the lye that is colour'd, putting fire under, till the water be all exhale; but the powder that remains being dry, with the oyl of Tartar dried and dissolved, must be cast again upon plates made of equal parts of gold and silver, within an earthen crucible; cover it so long with coles, and renew your work, till it be perfectly like to gold. Also I can make the same

Otherwise.

If I mingle the congealed quick-silver that I speak of with a cap, with a third part of silver, you shall find the silver to be of a golden colour: you shall melt this with the same quantity of gold, and put it into a pot: pour on it very sharp vinegar, and

and let it boil a quarter of a day, and the colour will be augmented. Put this to the utmost trial of gold, that is, with common salt, and powder of bricks, yet adding Vitriol, and so shall you have refined gold. We can also extract

Gold out of Silver,

And not so little but it will pay your cost, and afford you much gain. The way is this: Put the fine filings of Iron into a Crucible that will endure fire, till it grow red hot, and melt: then take artificial Chrysololla, such as Goldsmiths use to solder with, and red Arsenick, and by degrees strew them in: when you have done this, cast in an equal part of Silver, and let it be exquisitely purged by a strong vessel made of Ashes: all the dregs of the Gold being now removed, cast it into water of separation, and the Gold will fall to the bottom of the vessel, take it: there is nothing of many things that I have found more true, more gainful or, more hard to spare no labour, and do it as you should, lest you lose your labour: or otherwise, let the thin filings of Iron soak for a day in sea-water, let it dry, and let it be red hot in the fire so long in a Crucible, till it run, then cast in an equal quantity of silver, with half brass, let it be projected into a hollow place: then purge it exactly in an ash vessel: for the Iron being excluded and its dregs, put it into water of separation, and gather what falls to the bottom, and it will be excellent Gold. May be it will be profitable to

Fix Cinnaber.

He that desires it, I think he must do thus, break the Cinnaber into pieces as big as Wall-nuts, and put them into a glass vessel that is of the same bigness, and the pieces must be mingled with thrice the weight of silver, and laid by courses, and the vessel must be luted, and suffer it to dry, or set it in the Sun; then cover it with ashes, and let it boil so long on a gentle fire, till it become of a lead colour and break not, which will not be unless you tend it constantly till you come so far. Then purge it with a double quantity of lead; and when it is purged, if it be put to all trials, it will stand the stronger, and be more heavy and of more virtue: the more easie fire you use, the better will the business be effected: but so shall we try to repair silver, and revive it when it is spoil'd. Let sublimate quick-silver boil in distilled vinegar, then mingle quick-silver, and in a glass retort, let the quick-silver evaporate in a hot fire, and fall into the receiver: keep it: If you be skilful, you shall find but little of the weight lost. Others do it with the Regulus of Antimony. But otherwise you shall do it sooner and more gainfully thus: Put the broken pieces of Cinnaber as big as dice, into a long linnen bag, hanging equally from the porfides; then pour on the sharpest vinegar, with alom and tartar, double as much, quick lime four parts, and as much of oaken ashes, as it is usual to be made; or you must make some. Let it boil a whole day, take it out and boil it in oyl, be diligent about it, and let it stay there twenty four hours: take the pieces of Cinnaber out of the oyl, and smear them with the white of an egge beaten, and role it with a third part of the filings of silver: put it into the bottom of a convenient vessel, and lute it well with the best earth, as I said: set it to the fire three days, and at last increase the fire, that it may almost melt and run: take it off, and wash it from its face: that are left, at the last proof of silver, and bring it to be true and natural. Also it will be pleasant

From fixt Cinnaber to draw out a silver beard.

If you put it into the same vessel, and make a gentle fire under, silver that is pure, not mixed with lead, will become hairy like a wood, that there is nothing more pleasant to behold.

Chap.

CHAP. VII.

Of Operations necessary for use.

I Thought fit to set down some Operations which are generally thought fit for our works: and if you know them not, you will not easily obtain your desire, I have set them down here, that you might not be put to seek them elsewhere: First,

To draw forth the life of Tinne.

The filings of Tinne must be put into a pot of earth, with equal part of salt-peter, you shall set on the top of this seven, as many other earthen pots with holes bored in them, and stop these holes well with clay: set above this a glass vessel with the mouth downwards, or with an open pipe, with a vessel under it: put fire to it, and you shall hear it make a noise when it is hot: the life flies away in the fume, and you shall find it in the hollow pots, and in the bottom of the glazed vessel compacted together. If you bore an earthen vessel on the side, you may do it something more easily by degrees, and you shall stop it. So also

From Stibium

we may extract it. Stibium that Druggists call Antimony, is grownd small in hand-mills, then let a new crucible of earth be made red hot in a cole fire; cast into it presently by degrees, Stibium, twice as much Tartar, four parts of salt-peter, finely powdered: when the fume riseth, cover it with a cover, lest the fume rising evaporate: then take it off, and cast in more, till all the powder be burnt: then let it stand a little at the fire, take it off and let it cool, and skim off the dregs on the top, and you shall find at the bottom what the Chymists call the Regulus: it is like Lead, and easily changed into it. For saith *Dioscorides*, should it burn a little more, it turns to Lead. Now I will shew how one may draw a more noble Metal

To the out-side,

As foolish Chymists say, for they think that by their impostures they do draw forth the parts lying in the middle, and that the internal parts are the best of all; but they erre exceedingly: For they eat onely the outward parts in the superficies, that are the weakest, and a little quick-silver is drawn forth, which I approve not. For they corrode all things that their Medicament enters, the harder parts are left, and are polished and whitened: may be they are perwaded of this by the medals of the Ancients, that were within all brass, but outwardly seemed like pure silver; but these were soldered together, and beaten with hammers, and then stamp'd. Yet it is very much to do it as they did, and I think it cannot be done. But the things our tolisth are these, common Salt, Alom, Vitriol, quick Brimstone, Tartar; and for Gold, onely Verdigreale, and Salt Ammoniack. When you would go about it, you must powder part of them, and put them into a vessel with the metal. The crucible must be luted with clay, and covered: there must be left but a very small hole for perspiration: then set it in a gentle fire, and let it burn and blow not, lest the metal melt: when the powders are burnt they will sink down, which you shall know by the smoke, then take off the cover and look into them. But men make the Metal red hot, and then when it is hot they drench it in: or otherwise; they put it in vinegar till it become well cleansed, and when you have wrapt the work in linnen rags, that was well luted, cast it into an earthen vessel of vinegar, and boil it long, take it out and cast it into urine, let it boil in salt and vinegar, till no filth almost rise, and the foul spots of the ingredients be gone; and if you find it not exceedingly white, do the same again till you come to perfection: Or else proceed otherwise by order: Let your work boil in an earthen pot of water, with salt, alom, and tartar: when the whole superficies is grown white, let it alone a while; then let them boil three hours with equal parts of brimstone, salt-peter, and salt, that it may hang in the middle of them, and not touch the sides of the vessel; take it out, and rub it with

with sand, till the fume of the sulphur be removed again: let it boil again as at first, and so it will wax white, that it will endure the fire, and not be rejected for counterfeite; you shall find it profitable if you do it well; and you will rejoyce, if you do not abuse it to your own ruine.

CHAP. VIII.

How to make a Metal more weighty.

IT is a question amongst Chymists, and such as are addicted to those studies, how it might be that silver might equal gold in weight, and every metal might exceed its own weight. That may be also made gold, without any detriment to the stamp or engraving, and silver may increase and decrease in its weight, if so be it be made into some vessel. I have undertaken here to teach how to do that easily, that others do with great difficulty. Take this rule to do it by, that

The weight of a Golden vessel may increase,

without hurting the mark, if the magnitude do not equal the weight. You shall rub gold with this silver, with your hands or fingers, until it may drink it in, and make up the weight you would have it, sticking on the superficies. Then prepare a strong lixivium of brimstone and quick lime, and cast it with the gold into an earthen pot with a wide mouth: put a small fire under, and let them boil so long, till you see that they have gain'd their colour; then take it out, and you shall have it: Or else draw forth of the yelks of eggs and the lichearge of gold, water with a strong fire, and quench red hot gold in it, and you have it.

Another that is excellent.

You shall bring silver to powder, either with *aqua fortis*, or calx; the calx is afterwards washed with water, to wash away the salt, wet a golden vessel or plate with water or spittle, that the quantity of the powder you need may stick on the outward superficies; yet put it not on the edges, for the fraud will be easily discovered by rubbing it on the touch stone. Then powder finely salt one third part, brick as much, virriol made red two parts: take a brick and make a hole in it as big as the vessel is, in the bottom whereof strew alem de plumbe: then again pour on the powder with your work till you have filled the hole, then cover the hole with another brick, and fasten it with an Iron pin, and lute the joints well with clay: let this dry, and let it stand in a reverberating fire about a quarter of a day; and when it is cold, open it, and you shall find the gold all of a silver colour, and more weighty, without any hurt to the stamp. Now to bring it to its former colour, do thus: Take Verdgrease four parts, Salammoniac two parts, salt-peter a half part, as much brick, alem a fourth part; mingle these with the waters, and wash the vessel with it: then with iron tongs put it upon burning coles, that it may be red hot: take it off, and plunge it in urine, and it will regain the colour. If it shine too much, and you would have it of a lower colour, the remedy is to wet it in urine, and let it stand on a plate red hot to cool. But thus you shall make virriol very red: put it into a vessel covered with coles, and boil it till it change to a most bright red: take it out and lay it aside, and do not use it for an ill purpose. We may with the fragments of brasse

Do this business otherwise:

That shall supply the place of silver, and it shall become too weighty: Or otherwise, melt two parts of brasse with silver, then make it into small thin plates; in the mean while make a powder of the dregs of *aqua fortis*, namely of salt-peter and virriol, and in a strong melting vessel, put the plate and the powder to augment gold, fill the vessel in a preposterous order. Then lute the mouth of it, and let it in a gentle fire half a day: take it off, always renewing the same till it come to the desired weight. We have taught how to increase the weight, and not hurt the fashion

or

or stamp. Now I shall shew how without loss in weight, nor yet the stamp being hurt;

Gold and Silver may be diminished:

Some use to do it with *aqua fortis*, but it makes the work rough with knots and holes; you shall do it therefore thus: Strew powder of brimstone upon the work, and put a candle to it round about, or burn it under your work, by degrees it will consume by burning; strike it with a hammer on the contrary side, and the superficies will fall off, as much in quantity as you please, as you see the brimstone. Now shall I shew how

To separate gold from silver Cups that are gilded:

For it is oft-times a custome for Goldsmiths, to melt the vessels and cast them away, and to make new ones again; not knowing how without great trouble, to part the gold from the silver, and therefore melt both together. To part them, do thus: Take salt Ammoniac, brimstone half a part: powder them fine, and anoint the gilded part of the vessel with oyl: then strew on the powder, and take the vessel in a pair of tongs, and put it into the fire: when it is very hot, strike it with an iron, and the powder shaken will fall into the water, in a platter under it, and the vessel will remain unaltered. Also it is done

Another way

with quick-silver: Put quick-silver into an earthen vessel with a very wide mouth, and let it heat so long at the fire, that you can endure the heat of it with your finger, put into it: put the gilt plate of silver into it, and when the quick-silver sticks to the gold, take it out and put it into a Charger, into which the gold, when it is cold, will fall with the quick-silver. Going over this work again, until no more gold appears in the vessel. Then put the gold with the quick-silver that was shaken into the Charger, into a linnen clout, and press it out with your hands, and let the quick-silver fall into some other receiver, the gold will stay behind in the rag; take it and put it into a cole made with a hole in it, blow till it melt, make it into a lump, and boil it in an earthen vessel with a little Stribium, and pour it forth into another vessel, that the gold may fall to the bottom, and the Stribium stay atop. But if you will

Part Gold from a vessel of Brasse,

wet the vessel in cold water, and set it in the fire: when it is red hot, quench it in cold water; then scrape off the gold with latin wire bound together.

CHAP. IX.

To part Metals without aqua fortis.

BECAUSE waters are drawn from salts with difficulty, with loss of time and great charges; I shall shew you how to part gold from silver and brasse, and silver from brasse, without *aqua fortis*; but by some easie operations, with little cost or loss of time: And first I shall shew how

To part Gold from Silver.

Cast a lump of gold mixt with silver into an earthen vessel, that will hold fire, with the same weight of Antimony, thus: when the vessel is red hot, and the lump is melted, and turned about with the force of the fire; cast a little Stribium in, and in a little time it will melt also; and when you see it, cast in the rest of the Stribium, and cover the vessel with a cover: let the mixture boil, as long as one may repeat the Lords-prayer: take away the vessel with a pair of tongs, and cast it into another iron Pyramidal vessel red hot, called a Crucible, that bath in the bottom of it rams fat; shaking it gently, that the heavier part of gold separated from the silver, may fall

fall to the bottom: when the vessel is cold it is shaken off, and the part next the bottom will be gold, the upper part silver; and if it be not well parted, refuse not to go over the same work again, but take a less quantity of Stibium. Let therefore the gold be purged again, and let the Stibium be boiled, and there will be always at the bottom a little piece of gold. And as the dregs remain, after the same manner purge them again in the cople, and you shall have your silver, without any loss of the weight, because they are both perfect bodies; but the silver onely will lose a little. But would you have your silver to lose less, do thus: adde to two pound and half of Stibium, wine-les two pounds, and boil them together in an earthen vessel; and the mas will remain in the bottom, which must be also boild in a cople; then adding pieces of lead to it, purge it in a cople, wherein the other things being consumed by the fire, the silver onely will remain: but if you do not boil your Stibium in wine-les, as I said, part of the silver will be lost, and the cople will draw the silver to it. The same may be done

Another way.

Take three ounces of brimstone, powder them, and mingle them with one ounce of common oyl, and let them to the fire in a glazed dish of earth: let the fire be first gentle, then augment it, till it run, and seem to run over: take it from the fire, and let it cool, then cast it into sharp vinegar, so the oyl will swim above the vinegar, the brimstone will fall down to the bottom; cast away the vinegar, and let the brimstone boil in strong vinegar, and you shall see the vinegar coloured: you shall strain the vinegar through a wip into a glazed vessel, to which adde more brimstone, boil it again, and again strain out the lye into the vessel: doing this so oft, till the Lixivium comes forth muddy, or of a black colour. Let the Lixivium settle one night: again strain it through a wip, and you shall find the brimstone almost white at the bottom of the vessel: adde that to what you had before, and set it again to boil with three parts as much distilled vinegar, till the vinegar all evaporate and dry the brimstone: take heed it burn not: when it is dry, put it again into distilled vinegar, working the same way so often, until putting a little of it upon a red hot plate of iron, it will melt without flame or smoke. Then cast it on a lump of gold and silver, and the gold will sink to the bottom presently, but the silver will remain on the top. For if brimstone be boild in a Lixivium so strong, that it will bear an egg, until it will not smoke, and will melt on a fire-cole: if it be projected on a mass of gold and silver mingled, when they are melted, it will part the gold from the silver. Also there is an ingenious and admirable way

To part silver from brasse

with certain powders. The best are those are made of powdered lead, half so much quick brimstone, and arsenick, and common salt double as much, salt-peter one half; powder those fine each by themselves, then mingle them. Take the mix metal, with half so much more of the powder, and in a vessel that will endure fire, strew it in by turns, and set the vessel fire'd at a strong fire, till all melt; take it out and cast it into another vessel, that is broad at top, narrow at bottom, and hot, as we said, and smeared with ram or fowes grease clarified: let it cool, for you shall find the silver at the bottom, and the brasse on the top: part one from the other with an iron rasp, or file: if you will, you may purge your silver again in a cople. But the silver must be made into thin plates, that when it is strewed interchangeably with the powders, they may come at it on all sides: then cover the vessel with its cover, and lute it well. But the salt must be decrepitated that it leap not out, and the brimstone prepared and fixed. But we may thus

Part gold from brasse:

Make salt of these things that follow, namely, Vitriol, Alom, Salt-peter, quick Brimstone, of each a pound, Salt-ammoniac half a pound. Powder them all, and boil them in a lye made of ashes, one part, as much quick lime, four parts of beech-ashes: melt them at the fire, and decant them, and boil them till the Lixivium be gone; then dry

dry it, and keep it in a place not moist, lett it melt; and mingle with it one pound of powder of lead, and strew on of this powder six ounces for every pound of brasse made hot in a melting vessel; and let them be shaken, and stirred vehemently with an iron thing to stir it with: when the vessel is cold, break it, you shall find a lump of gold in the bottom. Do the rest as I said.

CHAP. X.

A compendium way to part gold or silver from other Metals with aqua fortis.

WE shall teach thus compendiously to part gold from silver, and silver from other metals; and it is no small gain to be got by it, if a man well understood what I write: for I have known some by this art that have got great wealth. For example, take a mixture of brasse and silver, dissolve it in common aqua fortis: when it is consumed, cast fountain-water into it, to remove the sharpness of the water, and that it can no more corrode the metal. Put the water into a great mouthed earthen vessel; and plunge plates of brasse therein; for the silver will stick to them like a cloud, the brasse is best in the water: put the water into a glass retort with a large belly, and make a soft fire under, and the fountain-water will distil forth by degrees. When you know that the whole quantity of fountain-water is distilled out, or the belly of the retort looks of a yellow colour, and the sent of the salts pierceth your nostrils: take away the receiver, and put another that is empty to it, and lute it well that nothing break forth. Augment the fire, and you shall draw off your aqua fortis as strong as before, and the brasse will be at the bottom of the retort: The aqua fortis will be as good as it was, and you may use it oft-times.



THE
SIXTH BOOK
OF

Natural Magick :
Of counterfeiting Precious Sones.

THE PROEMIE.

From the adulterating of Metals, we shall pass to the counterfeiting of Jewels. They are by the same reason, both Arts are of kin, and done by the fire. And it is no fraud, saith Pliny, to get gain to live by: and the desire of money hath so kindled the firebrand of luxury, that the most cunning artists are sometimes cheated. They are counterfeited by divers ways, either by cutting Jewels in the middle, and putting in the colours, and joyning them together; or else by giving a tincture to Crystal that is all one piece, or counterfeiting Crystal by many ingredients; or we shall attempt to make true Jewels to depart from their proper colour, and all of them to be so handsomely coloured, that they may shew like natural Jewels. Lastly, I shall shew how to make Smalls of divers colours.

CHAP. I.

Of certain Salts used in the composition of Gems.



We will first set down certain operations, which are very necessary in the making of Gems, lest we be forced to repeat the same thing over again: And first,

How to make Sal Soda.

The herb Kali or Saltwort is commonly called Soda: grinde this Soda very small, and sift it into powder: put it into a bras Cauldron and boil it, pouring in for every pound of Soda, a firkin of water. Let it boil for four hours, till the water be consumed to a third part. Then take it from the fire, and let it stand twelve hours, while the dregs settle to the bottom, and the water becomes clear: then drain out the water with a linnen cloth, into another vessel, and pour fresh water into the Cauldron: Boil it again, and when it is cold, as before, and all the dregs settled, filtrate the clear water out again: Do as much the third time, still having a care to try with your tongue, whether it be still salt. At last, strain the water, and set it in an earthen vessel over the fire, keeping a constant fire under it, until the moisture being almost consumed, the water grow more thick, and be condensed into salt; which must presently be taken out with an iron ladle, and of five pound of Soda, you will have one pound of salt.

How to make Salt of Tartar.

Take the lees of old wine, and dry it carefully; it is commonly called Tartar: put it into an Alimbeck, made in such sort, that the flame may be retorted from the top, and so augment the heat. There let it burn, you will see it grow white; then turn it with your iron tongs, so that the upper part which is white may be at bottom, and turn the back up to the flame: when it hath ceased smoking, take it out, and break part of it, to see whether it be white quite through, for that is an argument of the sufficient burning; because it oftentimes happens, that the outside onely is burned, and the rest of it remaineth crude. Therefore, when it hath gained the colour

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lour of chalk, it must be taken out; and when it is cold, grinde it, and lay it in water in some wide-mouth'd vessel a quarter of a day. When the water is grown clear, filtrate it, and strain it into another vessel, and then pour water again unto the settlement, observing the same things we spoke before, until the water have taken out all the salt, which will come to pals in the third or forth time. Pour your waters which you saved, into a vessel of glais; and all things being ready, put live coles under it, and attend the work until the water be consumed by the force of the fire, which being done, the salt will stick to the bottom: it being thus made, preserve it in a dry place, lest it turn to oyl.

CHAP. II.

How Flint, or Crystal is to be prepared, and how Pastils are boiled.

The matter of which Gems are made, is either Crystal or Flint, from whence we strike fire, or round pebbles found by river sides: those are the best which are taken up by the river Thames, white, clear, and of the bigness of an egge; for of those are made best counterfeit Gems, though all will serve in some sort. Some think that Crystal is the best for this purpose, because of the brightness and transparency of it; but they are deceived. The way of making Gems, is this: Take river pebbles and put them into a fornace, in that place where the retorted flame is most intense; when they are red hot, take them out and fling them into water: then dry them, and powder them in a mortar, or a hand-mill, until they are very fine; put them into a wide-mouthed vessel, full of rain water, and shake it well in your hands, for so the finest part will rise to the top, and the grossest will settle to the bottom: to that which swims at top pour fresh water, and stir the dust again: and do this oftentimes, until the gross part be quite separated and sunk down. Then take out the water, and let it settle, and in the bottom there will lie a certain slimy matter; gather together, and reserve the refined powder. But whilst the stone is ground, both the mortar and the mill will lose somewhat of themselves, which being mixt with the powder will foul the Gem: wherefore it will be worth the labor to wash that away: to which end, let water be often poured into the lavel, and stirred about; the dust of the mortar will rise to the top, by reason of its levity, and the powder of the pebbles will retire to the bottom by reason of its weight; skim the lavel, and separate them with a spoon, till all that sandy and black dust be taken off; then strain out the water, and reserve the powder dry. These being done, we must teach

How Pastils are boiled.

Artificers call those pellets which are made of the salts, and the forenamed powder and water, Pastils. Take five parts of salt of Tartar, as many of salt of Soda; double the quantity of these of the forepoken powder of pebbles, and mix them very well in a stone mortar: sprinkle them with water & wet them, so that they may grow into a pait, and make Pastils of them in bigness of your fist; set them in the sun, and dry them well. Then put them into a fornace of reverberation, the space of six hours, encreasing the fire by degrees, that at last they may become red hot, but not mele; wherefore use no bellows: when they are baked enough, let them cool, and they will become so hard, that they will endure almost the hammer.

CHAP. III.

Of the Fornace, and the Parts thereof.

Now the Fornace is to be built, which is like to that of glais-makers, but less according to the proportion of the work. Let your fornace be eight foot high, and consist of two vaults: the roof of the lower must be a handiul and a half thick: the vault it self must have a little door, by which you may cast in wood to feed the fire there.

there. Let it also have on the top, and in the middle of its roof, a hole about a foot in breadth, by which the flame may penetrate into the second vault, and reach to the upper roof; whence the flame being reverberated, doth cause a vehement heat. In this upper vault there must be cut out in the wall small holes of a handul in breadth, which must open and shut, to set the pots and pans in on the floor, and to take them out again. Artificers call these pots Crucibles; they are made of clay, which is brought from Valencia, and doth very strongly endure fire: They must be a finger thick, and a foot and a half deep, their bottom somewhat thicker, lest they should break with the force of the fire. All things being thus provided, cast in your wood and fire, and let the furnace heat by degrees, so that it may be perfectly hot in a quarter of a day. Your workmen must be diligent to perform their duty; then let the Pafils, being broken into pieces about the bigness of a wall-nut, be put into crucibles, and set in the holes of the furnace built for that purpose, with a pair of iron tongs to every pot. When they melt, they will rise up in bubbles, and growing greater and greater, must be pricked with sharp wires; that the vapor passing out, the bubbles may sink down again, and not run over the mouth of the crucibles. Then let other pieces be put in, and do as before, until the pots be filled to the top: and continue the fire for a whole day, until the matter be concocted. Then put an iron hook into the pots, and try whether the matter have obtained a perfect transparency: which if it have, take it out of the pots with iron instruments for that purpose, and cast it into clear water, to wash off the filth and stains, and to purge out the salt: for when the Gems are made, on a suddain the salt breaks forth, as it were spued out, and overcast them like a cloud. Yet there must be a great deal of diligence used, whilst you draw out this vitrified matter, lest it touch the sides of the furnace; for it will cleave thereto like birdlime, hardly to be pulled off without part of the wall: as also lest it fall into the vessels: for it is very difficult to separate it, and it prejudices the clearness of the glass. When it is cold, put it again into the crucibles, and let it glow for two days, some, to make it more fine and bright, lest it should be specked with certain little bubbles (to which glass is very subject) put into the crucible some white lead, which presently groweth red, then melts with the glass and becomes clear and perspicuous. Make your tryal then with an iron hook; for if it be clear of those bubbles, it is perfected, and so will be a perfect mass of Gems. Now we will teach the several Colours, Yellow, Green, or Blue, wherein we will cast our Gems.

CHAP. IV.

To make Colours.

While the Crystal is preparing in the furnace, by the same fire the Colours may be also made: And first,

How to make Crocus of Iron:

Take three or four pounds of the limature of Iron, wash it well in a broad vessel; for by putting it into water, the weight of the iron will carry that to the bottom; but the straws and chips, and such kind of filth, will swim on the top; so you will have your filings clean and wash'd. Then dry it well, and put it into an earthen glazed pot with a large mouth, and pour into it three or four gallons of the best and sharpest vinegar: there let it macerate three or four weeks, stirring it every day seven or eight times with an iron rod: then giving it time to settle, pour out the vinegar into another pot, and put fresh vinegar into the iron; and do this, till the vinegar have consumed all the filings. Then put all the vinegar into an earthen vessel, and set it on the fire, and let it boil quite away: In the bottom there will remain a slimy dirty matter, mixt with a kind of fatness of the iron, which the fire by continuance will catch hold of: let it burn, and the remaining dust will be Crocus. Others file your rusty nails, and heating them red hot, quench them in vinegar; then strain

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strain them, and dry the rust, and set it again to the fire, till it be red hot, then quench it again with vinegar; this they do three or four times: at length they boil the vinegar away, and take the remaining Crocus from the bottom. Next remains to shew

How to reduce Zaphara into Powder.

A little window is to be made out of the side of the furnace, nigh to which must be built a little cell or oven, so joyned to the mouth of the oven, that the flame may be brought in through a little hole. Let this cell have a little door without, to admit the workmans hand upon occasion. Let this cell be a foot in length and breadth. Set the Saffron upon a Porters tile, into the cell, and shut the door: let it be red hot, and after six hours take it out and put it into water, so will it cleave into pieces; let it be dried, stamped, and so finely seiced, that it may scarce be felt. But if it cannot be effected with a pebble and mortar; pour water upon the powder, and stir it with your hand, and let it settle for a while; then strain it into another vessel, and pour fresh water into the powder; and reiterate this so often, till that which settles, being beat and brayed, do pass through with water: then dry it, and it will become very fine powder.

How to burn Copper.

Set the filings of Copper, with an equal quantity of salt mixt in an earthen pot, over the fire, and turn it about three or four hours with an iron hook, that it may be burned on all sides: There let it burn a whole natural day: then take it out, and divide it into two parts; lay the one part aside, and set the other with salt on the fire again, for an artificial day: do the same three or four times, that it may be more perfectly calcined, always having a care that it be as hot as may be, but that it melt not. When it is burnt, it is black.

CHAP. V.

How Gems are coloured.

All things being thus prepared; there is nothing more, I think, remaineth to make an end of this work, but to know how to colour them. And we will begin with the way

How to dye a Sapphire.

Artificers begin with a Sapphire: for when it is coloured, unless it be presently removed from the fire, it loseth the tincture; and the longer it remains in the fire, the brighter it groweth. Put a little Zaphara, as they call it, into a pot of glass, two drachms to a pound of glass; then stir it continually from top to bottom with an iron hook: when it is very well mixed, make tryal whether the colour please you or no, by taking a little out of the pot. If it be too faint, adde some more Zaphara; if too deep, put in more glass, and let it boil six hours. Thus you may

Colour Cyanus,

or sea-water, another kind of Sapphire. Beat your calcined brasse into very fine powder, that you may scarce feel it; for otherwise it will mix with the Crystal, and make it couler: the quantity cannot be defined, for there are lighter and deeper of that kind: for the most part, for one pound one drachm will be sufficient.

How to counterfeit the colour of the Amethyst:

To a pound of Crystal, put a dram of that they call Manganese, and so the colour is made. If the Gem be great, make it the paler; if small, make it deeper: for they use such for rings, and other uses.

To counterfeit the Topaze.

To

To every pound of glafs, adde a quarter of an ounce of crocus of Iron, and three ounces of red-lead, to make it of a brighter red. Firft put in the lead, then the crocus.

The Chryfolite.

When you have made a Topaze, and would have a Chryfolite, adde a little more Copper, that it may have a little verdure: for the Chryfolite differeth from the Topaze in nothing, but that it hath a greater luftre. So we are wont

To counterfeit an Emerald.

This fhall be the laft: for we muft let our work be as quick as poffible, becaufe the copper being heavy, when it is mixed with the Cryftal, doth prefently fink down to the bottom of the pots, and fo the Gems well be of too pale a colour. Therefore thus you muft do: when you give the tincture to a Cians, you may eafily turn it into Smaragde, by adding crocus of iron, in half the quantity of the copper or brals, viz. if at firft you put in a fourth part of copper: Now you muft adde an eighth part of crocus, and as much copper. After the colours are caft in, let it boil fix hours, that the material may grow clear again: for the cafting in the colours will make them contract a cloudinefs. Afterwards let the fire decreafe by degrees, until the fornace be cold: then take out the pots and break them, wherein you fhall find your counterfeit precious Stones.

CHAP. VI.

How Gems may otherwife be made.

THe manner which I have fet down, is peculiar and ufual to our Artificers, and by them is alfo accounted a feeret. But I will fet down another way, which I had determined always to keep feeret to my felf: for by it are made with lefs charge, lefs time, and lefs labour, much more refulgent, bright, and livelier Gems, whole fuperficies and luftre, the falt fhall not deface in a much longer time. Although thofe old counterfeits which are found at Puteoli, in the mortar of ruined houfes, and on the fhores, are yet very bright, and of a perfect clearnefs, fo that they feem beyond the imitation of our age: Yet I will endeavour by this way, not onely to equal them, but to make much better. Wherefore give ear, and believe: the materials are thus made: Take the comb of a Cock, and cutting his gullet in two, keep the head and the neck, Put it into a pot, and fet it in a hard fire; ftop it clofe that no coles or afhes arifing with the fmoke, or foote, fall in, and fpoil the luftre of it. When the fire is kindled, you will hear it hiss: when it is red hot, take it up with an iron tong, and quench it in clear water, and dry it: Do this three times, changing the water left there fhould be any filth; then grinde it on a marble, till it be fo fine that you may blow it about, and referve it for ufe. Thence have you the Philofophers Stone, moft fragrant in fire, and chief in the triplicity. If thou art ignorant of the Philofophers Stone, learn it from thefe verfes, which I found in an old Manufcript.

Artus est hominis, qui confat sex elementis.

Cui p fi addideris, s. in m. mutare fi bene fci.

Hoc erit os noftrum confans lapis Philofophorum.

Now we have advertifd you of the materials: let us advife alfo about the colour. And firft of all, I will fhew you

How to counterfeit a Topaze.

Put your material into a pot, and cover it with a lid, full of holes; over which there muft be laid another, that it may exhale, and yet receive no hurt from the fmoke: let it ftand in its fornace to the middle the fpace of a whole day, and it will be a Topaze. Now

To

To counterfeit a Chryfolite,

crum the Cock, and for every ounce give him to eat two grains of the beloved flower of Venus: ftroak him, and in due time thou fhalt fee.

To make an Emerald.

Feed the Cock again, and for every ounce, give him four grains of wheat, and he will fhine with a moft bright luftre. But

To make a Jacinth,

give the Cock graines of the bloody Stone, inftead of wheat, and he will eafily lay hold of them.

CHAP. VII.

Of Several Tinctures of Cryftal.

I Have declared divers tinctures of glafs, and thofe no vulgar and common ones, but fuch as are rarely known, and gained, and tried with a great deal of labour. Now I will relate fome ways of ftaining Cryftal, and efpecially thofe that are choice, and known to very few; if not onely to my felf.

To ftain Cryftal with the colour of a Jacinth, or a Ruby, without breaking, or wearing it.

Take fix parts of Scibium, four of Orpin, three of Arfenick, as much of Sulphur, two of Tutty; beat them all alunder, and fift them through a fine feirce: put them into of Tutty; hang your Cryftal by wires, or cover it over with the powders, and fo fet it on the fire, that it may be hot, four or five hours; but ufe no bellows, left it break in pieces, or melt. It is a certain fign of being perfectly coloured, if you take out a piece, and that be of a bright and fhining colour; otherwife deliver it to the fire again, and after fome time try it again. But you muft have a great care, left it cool too fuddenly when you take it off the fire, for it will crumble and fall to pieces. If a violet-colour pleafeth you, take it foon from the fire: if you would have a deep purple, let it ftand longer: we can make a violet with Orpin onely.

To turn a Sapphire into a Diamond.

This ftone, as all others, being put in the fire, lofeth his colour: For the force of the fire maketh the colour fade. Many do it feveral ways: for fome melt gold, and put the Sapphire in the middle of it; others put it on a plate of iron, and fet it in the middle of the fornace of reverberation; others burn it in the middle of a heap of iron duft. I am wont to do it a fafer way, thus: I fill an earthen pot with unkill'd lime, in the middle of which I place my Sapphire, and cover it over with coals, which being kindled, I ftop the bellows from blowing, for they will make it flie in pieces. When I think it changed, I take a care that the fire may go out it felf: and then taking out the ftone, I fee whether it hath contracted a fufficient whitenefs; if it have, I put it again in its former place, and let it cool with the fire; if not, I cover it again, often looking on it, until the force of the fire have confumed all the colour, which it will do in five or fix hours; if you find that the colour be not quite vanifhed, do again as before, until it be perfect white. You muft be very diligent, that the fire do heat by degrees, and alfo cool; for it often happeneth, that fudden cold doth either make it congeal, or flie in pieces. All other ftones lofe their colour, like the Sapphire; fome fooner, fome later, according to their hardnefs. For the Amelike the Sapphire; for a foft and gentle fire; for a vehement one will over-harden it, and turn it to duft. This is the art we ufe, to turn other precious ftones into Diamonds, which being cut in the middle, and coloured, makeh another kind of adulterating Gems; which by this experiment we will make known: And it is

How to make a ftone white on one fide, and red or blew on the other.

I

I have seen precious stones thus made, and in great esteem with great persons, being of two colours: on one side a Saphire, and on the other a Diamond, and so of divers colours. Which may be done after this manner: For example, we would have a Saphire should be white on one side, and blew on the other; or should be white on one side, and red on the other: thus it may be done. Plaster up that side which you would have red or blew, with chalk, and let it be dried; then commit it to the fire, those ways we spoke of before, and the naked side will lose the colour and turn white, that it will seem a miracle of Nature, to those that know not by how slight an art it may be done.

How to stain glass of divers colours.

I will not pass by a thing worth the relation, which happened by chance, while we were making these experiments. The flower of Tinne taketh away the perticuity of Crystal glass, and maketh it of divers colours: for being sprinkled upon Crystal glasses that are polished with a wheele, and set to the fire, it doth variously colour them, and maketh them cloudy; so that one part will look like a stone, and another like an Opale of divers colours. But you must often take it out from the fire, and order it rightly, till it be according to your desire. I have before told you how to make flour of Tinne for the purpose. I will add somewhat more, indeed no secret, nor very necessary, but that nothing may be omitted by us in this work, viz.

How to make a Jacinth

beautiful enough, and not much unlike a true one. Put lead into a hard earthen pot, and set it on the fire in a glass-makers furnace, there let it remain for some days, till the lead be vitrified, and it will be of the colour of a Jacinth.

To counterfeit an Emerald.

You may do this almost in the same manner; and it will resemble the colour of a pleasant green corn. Dissolve silver with strong water, then casting into the water some plates of Copper, as I told you, it will cleave to them. Gather it together, and dry it, and set it into a glass-makers furnace in an earthen pot, within a few days it will become an Emerald. To do the same with other metals, I will leave to the trial of others; it is enough for me to have found out and discovered the way.

To counterfeit Carbuncles.

This we do with Orpin, and use it in some ornaments, for they are brittle, and of a most flagrant colour, have much of the scarlet bluish, and cast forth red sparkles. Take four ounces of Orpin, and grinde it small: then put it into a glass vessel, whose bottom you must fortifie against the force of the fire with mortar made with straw, and stop the mouth of it gently. The fire being kindled, the smoke lieth up, and the thinnest part of the material will rise to the top: and you will see it stick to the sides of the glass, and the neck: it will grow bigger by degrees, and new parts still flying up, will make it grow thicker; and like boiling water gather into bubbles, which at last will encrease so big, that they will fall down: Some will stick in the neck of the glass, all of a most flagrant colour, but brittle and small. Break the glass, and take off with a sharp point of a knife, those red congealed bubbles which stick to the glass, and use them. If you would make one great one of those little bubbles; lay a great many little ones upon a piece of glass, and melt them, and they will run into one: a most pleasant sight to see.

CHAP. VIII.

Of making Smalts or Enamel.

AFTER Gems we will endeavour to make Smalt or Enamel. It is a work almost of the same nature, and of the same mixture and colours; this only difference is between them, that in Gems the glass is transparent, in this it is more dense and solid.

solid. In antient times they made their Checker or Mosaicke work of it: and Goldsmiths do use it in colouring and enamelling gold. It is Tinne that gives it a body and solidity.

To make white Enamel,

Take two ounces of Lead ashes, four of Tinne; and make it into a body, with double the quantity of glass: role it into round balls, and set it on a gentle fire all night: take heed it stick not to the sides of the pot, but stir it about with an iron spittle, and when it is melted, increase the fire, and the business is done.

To make black Smalt.

To a pound of glass, you must adde a drachm of Manganese, for so it will be of the colour of a Lyon: then adde a drachm of Zaphara, and the mixture will turn black: make often tryal, if it be of a dark purple or violet-colour: for the Tin that giveth it the body, will make it blacker.

To make Smalt of a deep yellow.

You may put to every pound of Crystal a little Crocus Martis, and three ounces of Jalloline, as they call it, which engravers use: at last, Lead and Tin. But if you desire

To make Smalt of a paler yellow,

Instead of Jalloline, adde Jaletto, and you will have your desire.

To make green Smalt,

Adde burned Copper, and so it will be of a deeper colour: but if you desire it a paler, adde the flakes of Copper, which flie off, while the smith hammereth it, being red hot.

To make red Smalt,

Adde the rust of iron, very finely beaten: but when you would make

Smalt dark on one side, and transparent on the other,

Make your Pastils of earth, and double as much glass; set it a whole night in the fire of reverberation, and let it melt in a convenient vessel, stirring it with an iron rod: so you shall perceive both transparent and opacous parts in the same little Orb. So

To make Smalt of the colour of an Ametibist.

It is done with nothing but Manganese: and if you would have it of a deeper colour, adde more of the body, that is, of the flower of Lead and Tin.

To make Smalt of skie-colour.

It may be effected with Zaphara, by adding somewhat more of the body.

To make speckled Smalt,

which being full of small specks, shall seem to be compounded of a great many lices, very pleasant to behold. The opacous Smalt being made, pour it upon marble, and then presently sprinkle some Crocus upon it, or drop some pale colour in specks, all over it, and you shall have your desire.

To make Smalt of two colours,

cast Smalt first of one colour upon a marble, as before; and presently after, some of another colour upon that: then with an iron rod press them close, and joyn them together.

To make the best kind of Smalt,

such as Goldsmiths use; to every pot allow two roles of Sal Soda, and some sand, of which glass is made, and it will be much more perfect.

CHAP. IX.

To make Smalt of a clear rose-colour.

THe most skilful glafs-makers do labour very much, in colouring Smalt of a rose-colour; which is commonly called Rosficlere: seeing that in former times they did it most beautifully and artificially. I will set down what both I my self have done in it, and what I have received from other friends: I have performed the best I could, to shew others an opportune way of making better. The manner is this: cast ten pounds of Crystal in a pot, and when you know it to be well melted, adde a pound of the best red lead, by half at a time, stirring it with an iron rod as fast as you can; for the weight of it will make it sink to the bottom: when it is well mixed, take it out of the pot with iron instruments fit for the purpose, and cast it into water: do this thrice: then mix with it five ounces of Tin calcined, and Cinnabaris of a most bright colour; and so stirring them about for three hours, let them stand a while. When this is done, adde moreover three ounces of vitrified Tin, and beat them together without any intermission, and you will see a most lively rose-colour in the glats, which you may use in enamelling Gold.

To make Glafs of Tin.

Set a pound of Tinne in a strong earthen pot, into the fire: let it heat and melt; then remove it with iron tongs into the hottest flames of the glafs-makers furnace, for three or four days. Afterwards, the pot being taken out, and cold; break it, and in the top you will find glats of a saffron colour, not clear: but the longer it standeth in the fire, the perfecter it will grow; neither have I known better in this kind, of those many that I have tried. It must be reduced into fine powder: for the which not onely a mortar and mills will be requisite, but also a Porphyrian stone. If it be too florid, you may make it of a more faint colour, by adding glats to it.

Another way to make it.

This is onely for friends: Take nine parts of burnt Tinne, seven of Lead, two of Cinnabaris, of Spanish-soder and Tartar, one part and a half; of the Blood-stone one part, of Painters red a fourth part. And do with it, as in the former.

CHAP. X.

Of leaves of Metal to be put under Gems.

THere are certain leaves of Metal laid under Gems, which being perspicuous, are thereby made paler or deeper, as you will: for if you would have them of a fainter colour, you must put under them leaves of a more clear brightness: if of a deeper, leaves of a darker hue. Moreover, Gems being transparent, are seen quite through, and discover the bottom of the ring; which taketh much of their beauty off. This is an invention of later times, who by terminating the transparency of stones, with leaves of a most bright and pleasant colour, do fit and make up, and mend the colour of the stones. I have been very much delighted in this kind of work, and therefore will deliver it particularly. The leaves are to be made either of Copper alone, or of Copper, Gold, and Silver, mixt together. I will speak of those which are made of Copper alone: You must buy at the Brasiers-shops some thin plates of Copper, of the thickness of strong paper, that they may be the easier made thinner, which you must cut into pieces of three fingers in length, and two in breadth; so that a sheet of two pound, will be divided into a hundred and thirty parts: these we must divide again into two parts, that they may be hammered more easily: Take forty and beat them, as Artificers do gold, when they beat it out into thinnest rays. Let the anvil and hammer be smooth and polished, lest the heavy strokes should make dents in the Copper, and break it. Discontinue your work by turns, so that you may hammer the Copper while it is hot, and prepared by the fire; and put it into

into the fire, when it is cold: for if you do otherwise, it will break in pieces; which you must presently remove from the rest; for those that are broken, will break others. But that they may be the more easier prepared, when they begin to be examined, I make use of this invention. There must be prepared two plates of iron, of a hand-square, and the thickness of paper. Double one of them, that it may receive the other within the folds of it: so that they may receive the plates of Copper in the middle, and enclose them on all sides, that they can neither slip out, nor any dust or ashes fall in, to stick to them. When you have thus enclosed the Copper plates, put them into the fire, and heat them; then take them out with iron tongs, and shaking off the ashes, beat them with your hammer till they are cold, and so they will become thin and fine rays. But while you are beating one, let others to heat; and do this eight times over, until you have hammer'd them very thin and made them fit for your purpose. It will be worth your labor to look often upon them, to see if any be broken in the working, for they will break their fellows. But because they are wont to grow black in the working, and foul, so that they oftentimes deceive the eye, therefore it is fit, that you have a pot of water ready, with an equal quantity of Tartar, and salt in it, and let it boil over the fire: Put into it your rays, and stirre them about continually, till they be boiled white. Then take them out, and wash them in a pot of clear water, till they be very clean: then dry them with a linnen cloth, and then heat them, and beat them on the anvil again, as before, until they spread into rays, as thin as leaf-gold. When this work is to be done, the hammer and anvil must be as smooth, and polished, and bright, as a looking-glass; which you may effect in this manner. First of all, hold them to the grinde-stone, wherewith they grinde knives, until they be smoothed and planed: then rub them with fine sand, and Pumice-stone; afterwards glaze them with a wheele, and polish them with a plate of lead, and powder of emerald: if you use any other art, you will but lose your labour. Thus in two days your work will be finished, that is, by heating your plates, eight or ten times, and preparing them, and by whitening them four times at least: Finally, examine them all, whether they be whole, and of a sufficient thinness: so that if any remain too thick, they may again be brought to the hammer and perfected. But I must advertise you, that the thinner they grow, the less time they must lye in the fire, because they will presently melt: and so also in the water, because the salt will eat into them. At last, cut them with sheeres into square pieces, that they may be more convenient for use.

CHAP. XI.

How leaves of Metals are to be polished.

THe plates being thus thinned and finished, we will fall to polishing of them. But first we must provide tools, wherewith to perform it. Take a plate of Copper of a foot in length, and a hand in breadth, most exquisitely burnished: that it may be as smooth as a looking-glass: bow it either with your hand, or a hammer, by little and little, into the form of a semicylinder. Then turn a piece of wood, so that it may be equal, and fit for it in every part, and be received into the convexity of it, wherea being fastned with four nails at the corners of the plate, it may remain steadfast. Fix this wood upon a little frame, with two bars of a foot height, fastned to the ends of it. Now we will begin to burnish the plates; which must be thus done: provide chalk made into fine powder, after this sort; take some beaten clay, wrap it in a clean and indifferently fine cloth, and put it into a washing bowl full of water; stirre it about here and there, in the water, that the finest part may be washed through, and the coarser remain in the cloth: then put the new chalk into the cloth again; stirre it and strain it till it all pass through the cloth, and then suffer the water to settle, and seirce it through a Strainer; only changing the water, until no gross sediment remain: Then lay the cloth over the mouth of the vessel, which must receive it, and tie it slack on: so strain it, that you may be the more sure, that nothing but what is very fine can pass through: then press out the water, and reserve the chalk. Lay this

clay, thus prepared, upon the Copper, and rub it with a poplar stick, till it shine like gold: then wash it with water, over a wide-mouthed pan, that may receive the water. After this, have a blood-stone ready, very well polished, upon a plate of lead, with the dust of Emerald, it will become most exquisitely smooth: therefore, lay your rays of copper upon the copper, and spread it abroad with the thumb of your left hand; then cast on the clay, and pour water on to wash it, and then wipe it off, and let only the water remain to fasten them upon the copper. Then take into your hands the stone, being fastened to a stick; and polish the plates with it, having a great care that they do not run into wrinkles; for then they are quite spoiled: but when they begin to move, pour on some of the water, and that will fix them again: Continue this, till you have made it all over as bright and smooth as a looking-glass. A token of their perfect polishing is, when no marks of the running of the stone, is seen upon them. Then taking them off from the wood, cast them into a por of water, until the rest are all finished; and then wrap them in a clean linen cloth: dry them, and lay them up in boxes, free from all dust, and filth: but bend them like a half-pillar, so that the polished side may be inward; and tie them so with a string.

CHAP. XII.

Of building a Fornace for the colouring Plates.

NOW we will shew how to colour them: but first, let us describe the fornace, wherewith it must be done. Therefore let a Fornace be made of iron plates of a convenient thickness: let it be a foot in height, and as much in the diameter of the length; let it be covered on the top, with a circular plate: In the centre of the roof of it, cut a round hole, a handfull in breadth: and set another fornace upon it, of the same length and breadth, and make a hole in that also, which must be set against the other, and join them close together. Make a little door in the lower fornace, close to the ground; let it be made with an arch, four fingers wide, and jet out half a foot, like the mouth of an oven, and be joynd in the same manner to the great fornace. Then kindle your coals in another place, until they cease smoking, and with iron tongs cast them into the foresaid fornace: Heat it very well, and let the outward fornace or mouth of the oven be fill'd half way with live coals. These being thus disposed, fall to colouring the plates. And first, I will teach you

How to colour plates with a purple colour.

Take the plates tyed about with thread, as I told you, and fit them upon a pair of iron tongs, which you must fasten at the fore-end with an iron ring, that they may not open: hold them upon the hole of the upper fornace, that they may receive the ascending smoke; and turn them about, until by degrees you shall perceive them gather a purple colour, without any other smoke then what ariseth from the heat of the coals: when you think them coloured enough, remove them from the smoke, and lay them aside.

How to make them of a Sapphire colour.

It is done much after the same way: for taking the rays in an iron tongs, and holding them over the hole of the fornace, cast upon the coals through the low arched door, the feathers of a goose, which grow upon her breast, and then lay upon them a red hot iron rod. For the smoke of the feathers, arising through the tunnel of the fornace, will beat upon the rays, and make them of a sky-colour: when the iron rod groweth cold, take another and put in. It is very admirable, how on a suddain these copper rays will change into several colours: wherefore, when they have obtained the colour which you desire, take them off the fornace presently, for otherwise they will alter into another.

How to make them of a silver colour.

Take a little silver, and dissolve it with *aqua fortis*: then pour some fountain-water into

into it, and your copper rays: presently the water will be troubled, and will stick upon the copper like silver fleeces: cast away the water, and wash the silver, and dry it in the Sun; and when it is dry, lay it upon a marble, and mix with it an ounce of Tartar, and as much ordinary salt: grinde them together, till they be well mixed. This being made into powder, lay it on copper, and rub it with your fingers, and it will make it shine like silver: then spread the rays upon the round wood, and the copper; wet them with the water, lay the powder on them, and rub them with your thumbs, that they may become of a silver colour; steep them in water, and levigate them with the blood-stone upon the foresaid copper; then set them in the smoke, and they will shine with a sky-colour.

How to make them of the colour of an Emerald.

It is very difficult, and there scarce is one of very many that will prove right. First, make your rays of a sky-colour, as before; then take those which have not took that colour rightly, and lay two of them upon the hole of the fornace: and through the vault of the little door, fling some leaves of Box upon red hot plates of iron, where they will crackle like bay-leaves, and send up a smoke through the hole, which will colour the rays. But before they come to be of a green colour, they must pass through many other colours, as yellow, red, and sky-colour; but they must continue some time before they obtain a perfect green.

How to make them red, like a Ruby.

Fling some flocks of Scarlet upon the live coles, and lay the thin plates over the hole, and the arising smoke will colour them red.

How to make them of the colour of the Amethyst.

When it is made of a sky-colour, it passeth through the colour of the Amethyst; take it therefore off in time, and you have your wish.

CHAP. XIII.

How rays are to be coloured by a mixture of Metals.

I Will now shew how rays may be coloured by mixture with other metals; which is of more difficulty, but of longer continuance. The former cost but little labour, but they easily lose their colour: these are harder to be made; but keep their colour longer. Take half a pound of copper, and melt it in a melting pot, put thereunto half a crown of gold; and when it is well melted, and mixed, adde some tartar, that when it cooleth, the top of it may be plain and smooth; after it is cold, set it aside. Then take another half pound of copper, and melt it in the same manner; mix a drachm of silver with it, and let it cool: take it out of the pot, and file the out-side of it smooth; for the least crack, or chap, would spoil the work. You may know whether there be any crack within side or without, by this sign; place it in an even poise upon a piece of iron, and strike it with another piece; if it found equally, and ring clearly, it is whole; if it do jar, it is cracked somewhere. Let your pieces of metal be about a finger in bigness; beat them gently upon the anvil, lest they break somewhere: set them in the fire and season them, and when they are cold, beat them with the hammer into thin rays, as I have said before: if they chance to crack, file off the flaws; and when they have been seasoned twice or thrice, in the fire, have your pot of water ready, prepared with salt and tartar, to whiten them, that you may more exactly find out the cracks.

To make them of the colour of a Ruby.

The plates being finished, if you would make them of a ruby colour, do it with flocks of scarlet, as before; but then the rays must be of the mixture of copper and gold.

To make them of the colour of a Sapphire or Emerald.

Let the plates be of copper and silver: the Sapphire colour is made with goose feathers, but the Emerald with box-leaves, holding them somewhat longer over the fire. And these are the experiments which I have made concerning Gems.

THE
SEVENTH BOOK
OF

Natural Magick :

Of the wonders of the Load-stone.

THE PROEM.

WE pass from Jewels to Stones: the chief whereof, and the most admirable is the Load-stone, and in it the Majesty of Nature doth most appear: and I undertake this work the more willingly, because the Ancients left little or nothing of this in writing to posterity. In a few days, not to say hours, when I sought one experiment, others offered themselves, that I collected almost two hundred of principal note; so wonderful is God in all his works. But what wiser and learned men might find out, let all men judge. I knew at Venice R. M. Paulus the Venetian, that was busied in the same study: he was Provincial of the Order of servants, but now a most worthy Advocate, from whom I not only confesse, that I gained something, but I glory in it, because of all the men I ever saw. I never knew any man more learned, or more ingenious, having obtained the whole body of learning; and is not only the Splendor and Ornament of Venice or Italy, but of the whole world. I shall begin from the most known experiments, and pass to higher matters, that it may not repent any man of his great study and accurate diligence therein. By these, the longitude of the world may be found out, that is of no small moment for Saylor; and wherein the greatest wits have been employed. And to a friend that is at a far distance from us, and left shut up in prison, we may relate our minds: which I doubt not may be done by two Mariners Compasses, having the Alphabet writ about them. Upon this depends the principles of perpetual motion, and more admirable things, which I shall here set past. If the Ancients left any thing of it, I shall put that in by the way: I shall mark some false reports of some men, not to detest their pains and industry, but lest any man should follow them in an error, and so errors should be perpetual thereby. I shall begin with the Name.

CHAP. I.

What is the Name of this Stone, the kind of it, and the Countrey where it grows.



Later in Ionic writers, that Empedocles called this stone *μαγνίτη*, but *Lucretius* from the countrey Magnesia.

The Greeks do call it *Magnes* from the place, For that the Magnets Land it doth embrace.

And the same *Plato* saith, some call it *Ηρακλίτη*. *Theophrastus* in his book of Stones calls it *ήρακλίτης*, that is *Heracleum*, because he found it about the city Heraclea. Others think it denominated from *Ηρακλεις*: for as he conquered and subdued all beasts, and men; so this stone conquers iron, which conquers all things. *Nicander* thinks the stone so called, and so doth *Pliny* from him, from one *Magnes* a shepherd; for it is reported that he found it by his hobnail shoes, and his shepherds-crook that it stuck to, when he fed his flocks in Ida, where he was a shepherd. But I think it is called *Magnes*, as *yon* shortly say *Magnus*, onely one letter changed. Others call it *Siderites* from *σίδηρος*, that is Greek

Of the wonders of the Loadstone.

Greek signifies iron, and the Latine call it *Magne*; *Heraclius*, and *Siderites*. *Hesychius* makes the stone *Siderites* to be different from *Heraculus*; for he saith, one hath an iron colour, and the other a silver colour. Also *Pliny* from *Sotacius* makes five kinds of it. The Ethiopian, the *Magnesian* from *Magnesia* near *Macedonia*, as the way lies to the Lake *Bebis*, on the right hand; the third in *Echium* of *Bithynia*, the fourth about *Alexandria* at *Troaderum*; the fifth in *Magnesia* of *Asia*. The first difference is, whether it be male or female; the next in the colour: for those that are found in *Macedonia* and *Magnesia*, are red and black; but the *Boeotian* is more red then black: That which is found in *Troas* is black, and of the female kind, and hath no force therefore. But the worst sort is found in *Magnesia*, of *Asia*; it is white, and attracts not iron, and is like a *Pumice* stone. It is certain, that the bluer they are, the better they are. The Ethiopian is highly commended, and it cotts the weight in silver. It is found in *Ethiopia* at *Zimirum*; for so is the sandy country called. It is a token of an *Ethiopick* stone, if it will draw another Loadstone to it. There is also a mountain in *Ethiopia*, not far off, that produceth a stone called *Theamedes*, that drives away all iron from it. *Diocorides* describes it thus. The best Loadstone is that which easily draws iron, of a bluish colour, thick, and not very weighty. *Plutarchus* makes three sorts of them; one that draws iron, another fleshy, another that draws and repels iron; very ignorantly: for the fleshy Loadstone is different from this, and one and the same stone draw & drives iron from it. *Marbodorus* saith, it grows amongst the *Proglodites* and *Indians*. *Olavus Magnus* reports, that there are mountains of it in the North, and they draw so forcibly, that they have ships made fast to them by great spikers of wood, lest they should draw out the iron nails out of the ships that pass between these rocks of Loadstone. There is an island between *Corfica* and *Italy*, call'd *Illa*, commonly *Eiba*, where a Loadstone may be cut forth: but it hath no vertue. It is found in *Cantabria* in *Spain*, *Bohemia*, and many other places.

CHAP. II.

The natural reason of the Loadstones attraction.

BECAUSE some have written whole Books, of the reason of the Loadstones attraction of iron: lest I should be tedious, which I purpose not to be, I think fit to pass over other mens opinions, especially, because they depend onely upon words and vain cavils, that Philosophers cannot receive them; and I shall set down my own, founded upon some experiments: yet I shall not pass by the opinion of *Anaxagoras*, set down by *Aristotle* in his Book *De Anima*, who by a similitude calls it a living stone, and that therefore it draws iron; and for some other peculiar forces, which might be properly said to proceed from the soul, as you shall see. *Epicurus* would faine give a reason for it, as *Galen* and *Lucretius* report. For, say they, the Atoms that flew out of the iron, and meet in the Loadstone in one figure, so that they easily embrace one the other; these therefore, when they light upon both the concretes of the stone and iron, and then flie back into the middle, by the way they are turned between themselves, and do withall draw the iron with them. *Galen* inveighs against this; for he cannot believe, as he saith, that the small atoms that flie from the stone, can be complicated with the like atoms that come from the iron, and that their embracing can draw such a heavy weight. Moreover, if you put another iron to that which hangs, that will fasten also, and another to that, and so a third and fourth: & the atoms that result from the stone, when they meet with the iron, they flie back, and are the cause that the iron hangs; and it is not possible that those atoms should penetrate the iron, & through the empty pores should rebound unto the former atoms, and embrace others, whereas he saw five iron instruments hang one by the other. And if the atoms be diffused straight forward through the iron, why then do other iron nails stick, fastned but on the sides? for the vertue of it is spread every way: Wherefore if a very little Loadstone should touch many small bodies of iron, and these others, and those others again, and the Loadstone must fill them all; that small stone would even be consumed into atoms. But I think the Loadstone, is a mixture of stone

stone and iron, as an iron stone, or a stone of iron. Yet do not think the stone is so changed into iron, as to lose its own Nature, nor that the iron is so drowned in the stone, but it preserves it self; and whilst one labours to get the victory of the other, the attraction is made by the combat between them. In that body, there is more of the stone, then of iron; and therefore the iron, that it may not be subdued by the stone, desires the force and company of iron; that being not able to resist alone, it may be able by more help to defend it self. For all creatures defend their being: Wherefore, that it may enjoy friendly help, and not lose its own perfection, it willingly draws iron to it, or iron comes willingly to that. The Loadstone draws not stones, because it wants them not, for there is stone enough in the body of it; and if one Loadstone draw another, it is not for the stone, but for the iron that is in it. What I said, depends on these Arguments. The pits of Loadstone are where the veins of iron are: these are described by *Galen*, and such as deal in Minerals, and in the confines of them both; of the stone and the iron they grow, and the Loadstones are seen, wherein there is more stone, and others in which there is more iron. In Germany a Loadstone is digged forth, out of which they draw the best iron; and the Loadstone, whilst it lies in the filings of iron, will get more strength; and if it be smeared or neglected, it will lose its forces. I oft saw with great delight a Loadstone wrapt up in burning coles, that sent forth a blue flame, that smelt of brimstone and iron; and that being dissipated, it lost its quality of its soul that was gone, namely, its attractive vertue. It is the stink of iron and brimstone, as such who destroy iron by reducing it to a Calx, or use other Chymical operations, can easily try. And I thought that the same soul, put into another body, must necessarily obtain the same faculty.

CHAP. III.

That the Loadstone hath two opposite Poles, the North and South, and how they may be known.

Because the effects of the Loadstone are many and divers, I shall begin to distinguish from the effects of it, that the Readers may receive more benefit and direction. The effects of the Loadstone, are of the stone onely, or of the iron touched with the stone, or of them both, the iron and the stone. The simple effects of the stone, are to draw the stone, to respect the Poles of the world, and such like: also they are mixt and compounded. We say therefore first, that the stone hath two points, that stand opposite one to the other, be it in a great or small stone, which we call the Poles: one of them is directed to the North, the other to the South: For if the stone be at liberty, and hangs that it may play, without any impediments from its weight, one part turns freely to the North, and the contrary part to the South. The way to try it is thus: Take a little piece of Cork, or Fennel-gigant, or some other light wood, and make it like a Boat, that it may serve to bear up the weight of the stone. Put the stone into this vessel, that it may be equi-distant from the bottom. Put the Boat into a vessel full of water, that it may move here and there, and find no impediment; let it be alone, and the Boat will never rest, until the point of the stone stand full North, and the opposite point full South. When the Boat stands still, turn it about twice or thrice with your finger, and so it will come again to rest, and return to the same posture; and this shall make you more certain of the North and South Poles of it. There are many more ways to prove it, for letting it hang equally, as in the Mariners Compass; for where it can move of it self freely, it still directs to the same points: and you may do the same if you hang it by a small thread. Hence we may easily learn,

To know which Loadstone is the more perfect.

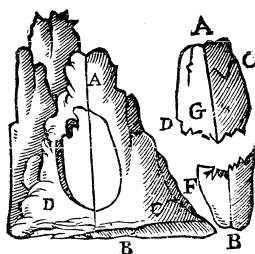
Which a man may easily do by the former trial, and find out what Loadstone is void of vertue, or most forcible. For that Loadstone that doth soonest bring about the Boat to the points, and having found the north Pole, stands still, is certainly the most forcible stone. But that which slowly works, and comes softly about to its place, and stops oft, is more weak and feeble. Also we may be certified another way: for that which can turn about the greater piece of wood, or boat, not slowly, but quickly, is the best stone. And though there be more ways to try it, yet let these suffice at present: we shall speak of the rest in other places.

Chap.

CHAP. IV.

The force of the stone is sent by a right line from North to South, through the length of it.

But the two points we speak of, are the end of the right line, running through the middle of the stone from North to South; if any man break the stone, and break this line, those ends of the division will presently be of another property and vertue, and will be enemies one to the other: which is a great wonder: for these two points, when they were joined together, had the same force of turning to the pole; but now being parted asunder, one will turn to the North, the other to the South, keeping the same posture and position they had in the Mine where they were bred: and the same happens in the least bits that are seen in the greatest load-stone.



For example: let the rock of Loadstone be ABCD, and let the line from North to South be AB: if we shall cut the stone AB out of the rock, the very line AB in the stone will represent the polar line from North to South. But if we break the stone broad-ways, every little piece will keep its line. Cut the stone AB broad-ways, as CF, there will be two stones; ACD, and EFB: I say, the stones cut through the line CD, each of them will have its poles of the world. In the stone AGD, the North-pole will be A, the South G. In the stone EFB, the North will be H, the South B; and that is beyond all admiration, that the points GH whilst the stone was but one, were but one: as being agreed together, they had the same forces; but when the stone is divided, each part will hold its vertue, and be quite contrary and at enmity: for G always turns to the South, and H to the North, and every bit will have its poles: and if you fit the divided stones with boats, A and H will turn to the North, G and B to the South: and the same will fall out, if you divide AG and HB into many small pieces; and if you afterwards join all these pieces together as they were, their mutual discord of nature will be presently reconciled. Wherefore *Cardanus* laid false, that the Loadstone draws where it hath but a thin cover, and more in one part then another: for it attracts onely from one certain point, as it had its position before in the mines.

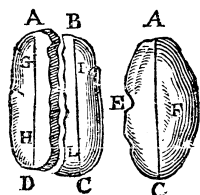
CHAP. V.

That the polar line in the Loadstone is not stable, but moveable.

But the like wonder of nature cannot but be admired amongst many that God hath made, and therefore I would have no man ignorant thereof. This polar line (spoken of, is not alwayes certain in the same place, nor doth it stand alwayes firm; but changes, and takes the contrary positions: but this is constant in it, that it alwayes runs through the middle of the stone, like a King that hath alwayes his Court or fort in the midst of his Country: for consisting in the centre from whence the extreame parts are as it were the circumference, it can easily send its forces to all parts, and defend it self. But an example shall clear this.

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Let

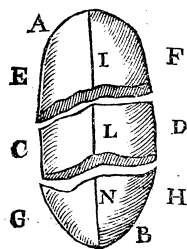


Let the stone be AECF, and let the line AC running through the length of it, be the polar line we speak of, wherein the force of it resides, which runs from the North to the South pole; I say, if you divide the stone in two pieces by the line AC, that one piece may be AED, the other BCF, if they be taken asunder, that the force of it doth not reside in the extreame part of the line AD or BC; but being divided in the middle, the force is received in the middle of each stone, and in the stone AED, it will be GH, and in BCF, it will be IL: which cannot be spoken without admiration, that in a dead stone there should be a living vertue to move it self: who is there, unless he try it, that will believe these things? For as the line that stretcheth from North to South was in the prime, so if you divide the stone into a thousand parts, that force is sent into all those parts, each of them holding its own line in the middle of it; so if we shall divide the part AED into other parts, and shall part the smallest of them, what part soever is parted from its confines, it will have that same lively force running long ways through the middle of it: and so it will be, if you divide the stone into the smallest sand: but the greater wonder is, that if you join all the parts together again as they were at first, they will all have the same force united, and that will retire into the middle of the stone.

CHAP. VI.

That the force of North and South is vigorous in the points.

But what is more wonderful? Though the force retreats to the middle of the stone, yet it doth not send it self forth by the middle, but by the extreame parts of the stone, and lies still in the middle, as if it were asleep; but it is awake in the end, and there it comes forth: But if a man break the stone, he shall see it more perfectly. I shall give an example for such that are curious, to search out the vertue of the Load-stone.



Let the Load-stone be AB, and A the North pole, B the South; I say that in AB the end of the stone, the force is greater, and in the middle of the line ILN, it is more weak and drowie, unless there be any vertue unknown in the right and left side CD. but the nearer it is to the North or South, the more it augments; but the farther off it is, the more it faints. Break the stone in C and G, wherein there lay hid a vertue unperceived, but it will appear when the stone is broken, and shew its properties, and one point will shew forth the North, the other the South. And if these things seem superfluous, yet are they necessary, as the grounds of what I must say.

CHAP. VII.

That by the touching of other stones, those points will not change their forces.

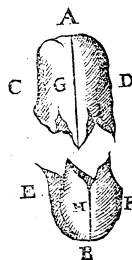
And because I said that the Load-stone doth not always hold its forces equal, but that one stone is more powerful in operation than another, for some are faint and weak; I shall put the first question, whether by rubbing and touching the weaker stones with the stronger, those forces will be changed, or stay as they were; as, if a Load-

Load-stone is sluggish in pointing out the pole, whether in a stronger stone rubbed with the North point upon the North point of the weaker, can help it at all; or if we shall rub the South point of the other on the North point of this, whether the North point rubbed on will be gone and become the South point, or continue in its former vertue? Where we have not reason to direct us, experience shall prove it. For let a Loadstone be of what forces and properties it may be, by rubbing it against a Loadstone of less vertue, it will never lose any thing, but continues immutable; and being left at liberty in its boat, it will turn voluntarily to its own pole, and decline the contrary part. And though we cannot find the cause of it, yet it seems not against reason; I say, that in stones of the same kind, the greater stones have the greatest forces; and when one Loadstone is rubbed against another, it will leave certain hairs, which are but the bruised small parts of the stone, that stick like hairs, and these are they that lend force to iron and other things to attract, and to turn to the pole; but if the stone that is rubbed and receives it be greater than those hairs, it can never be that the greater vertue should be conquered by the less, always the stones being of the same kind, since the hairs have as it were no proportion to the magnitude of it. And as the hairs to the stones magnitude are insensible, so it is impossible that they can wrest the force of it to the contrary pole.

CHAP. VIII.

That a Loadstone will draw a Loadstone, and drive it from it.

I shall speak of the other operation of it, which is of its attracting and repelling. This is both admirable, and delightfull to behold with our eyes, and to consider in our mind, that the part of one Loadstone should so carefully search out another, allure and attract it, to enjoy its company, and to foster it in its bosom; and again, another should be such an enemy to it, that they are at mutual discord, so that putting their contrary ends together, the one will be so contrary to the other, and hate as it were the force of it, that it will turn the contrary way: namely, the North part of the one doth not indifferently draw any part of every other stone, but a distinct and certain part; nor doth it drive every part from it, but that part it naturally abhors, and cannot endure, as being contrary unto it. The North part of the one will draw the South part of the other, and drive away from it the North part of the same; and the South part of this is not an enemy to the North part of the other, but to the South part of it. The same will appear better by an example.



Let there be two stones ACD, and EBF: in the first stone let A be the North pole, and the point G the South; in the stone EBF let the North part be H, the South B: I say, if you put the South part G, of the stone CAD, to the South part B, of the stone EBF, it will presently drive it from it; and the same will happen if you put the North pole A to the North pole G. Again, if you shew the North point A to the South point H, or the South point B to the North point A, as being mutually agreed, it will draw the part to it that is not against it. The reason of it I know; for since that the South part G, had formerly been fast to the North part H, when the parts are divided they always seek to unite again, to preserve the same body, as Philosophers say. But if the South point G had been fast with the South point B of another stone, B flies off presently, and departs from it; or if you shew the North point A, to the North point H, the same will come to pass; for they refuse one the other, because they did not so stand in their Mine. Here I shall confute the error of Pliny, and of his followers, who think that no other Loadstone hath this vertue but the stone of Ethiopia; but it is common to all Loadstones. Also, it is a sign, saith he, of the Ethiopian stone, because that will draw another whole

whole Loadstone to it. Also Cardanus fully affirms that one Loadstone will not draw another; but it will draw it, because the iron is concealed in it that it had first drank in. In brief, the poles that are unlike, will join together, by reason of the similitude of their substance, and likeness of inclination; but the poles that are the same, by a contrary inclination are at enmity: that is, the North point seeks the South point, and the South the North point; so shall the South and North points reject South and North points. Yet we must tell you by the way, that when we try the stones, let them not be both great and vast stones, that being hindered by their weights cannot perform their office: but let one be great, and the other small; or both small, that they may be mutually repulsed or drawn on. The trial is easie, if they be hanged by a thread, or put into their boats, or if they play equally balanced upon the needle.

CHAP. IX.
A sport of the Loadstone.

I Will not pass by a merry conceit of the Loadstone, that I have oft-times made my friends sport with, for the good of those that are curious in the search of the reasons of things. How in a short time two kinds of sands mingled, and laid on a heap, may be parted one from the other very suddenly: for the standers by, that cannot sound the reason of it will, think it impossible. The trick is this: Pown a Loadstone into very fine sand, and put some white sand, or some other sand together with it, and mingle them, and make a heap of them: for if you put a Loadstone to it, either uncovered, or covered with linen (that the standers by may not know it) presently the sand of the Loadstone, as in league with it, will run like small hairs joined together, and will stick fast to the stone, which you may brush off and lay aside, then come again, and what is behind will run to the stone, till you have drawn it all out; and it will cause no little wonder, that when the Loadstone comes to the heap, the sands that were mingled should be parted asunder. But the more easly to powder the Loadstone, do thus. Put the Loadstone into an iron mortar, lay a blanket or some other soft thing upon it, for it will thus yield to hand-strokes, and presently crumble; if not, you must beat hard on the bottom of the mortar, and batter the pebble. Also the same thing befalls us in a certain sand that is brought to us out of an iron Mine from Porchys, for it hath the colour and shining that iron hath; and by the proximation of the Loadstone, it is soon parted from the other, to the admiration of those that are present. It may be this experiment was made, because the ancients report that the Loadstone will draw iron, sand, oyle, and all things.

CHAP. X.
The greater the Loadstone is, the greater is the force of it.

And you must know, that the bigger Loadstone will cast forth its force at a farther distance, and brandish it, and attract the opposite Loadstone with more violence, and draw it to it, and that in the same sort of stone; as if a Loadstone be a pound weight, and another Loadstone be a good distance from it, it will presently leap, and meet the other that draws it. If we cut off half that stone, the force of it will decay, and be dull as if it were dead, and the vigor of it is taken away by the proportion of the part taken from it. If any man will not believe it, let a stone be fetcht for trial; for a part being taken away, part of the virtue is lost also: join the part taken away as it was, and the force will be restored, and become more lively, and will be as powerful as formerly, that it will leap at a Loadstone that meets it at a great distance, and presently embrace it. This argument confirms it, that the greater the stone is, the greater force it hath, even in the same sort of stones: for I have seen divers Loadstones, brought from divers parts of the world

world, to have divers properties. I saw at Rome, a Loadstone weighed an Ounce, that drew two Ounces of Iron, and held it so fast as it drew, that it could scarce be pulled from it. I have seen others of forty Pound weight, that were so feeble, that they would scarce stir an Ounce. But that I may the more oblige the curiosity of Students in this matter, I shall teach in the following Chapters, how the Vertue of the Stone may be tried and equally balanced.

CHAP. XI.

That the force of this Stone will pass into other Stones, that sometimes you may see as it were a rope of Stones.

The Stone with us is commended for another property; for when it hath taken hold of another Stone, it not only holds that fast, but it sends into the Body of it an effusion of its forces; and that having got more forces, draws another, and gives it the like faculty: the third made to partake of the same vertue, draws others that are near or far off, and casts forth and brandisheth the same vertue; and this draws another: and so, by a reciprocal ejaculation, by the same force it is held, by the same it holds others; and from each of them to the other, are their darts flying, as it were endowed with the vertue of them: and if you lift them up on high, they seem to hang in links like a Chain, that they will not easily be drawn one from the other; that we must needs wonder exceedingly, how that internal and invisible force can run from one to the other, and pass through them: and the more vertue it hath, the more it doch communicate it. Yet I thought fit to forewarn you that you fall not in your trial, that the Stones must stick the one to the other by the parts that agree, and not by contrary parts; for so would not one impart his vertues to another, but by the meeting with an opposite part, would be held back, and cease from doing its Office; namely, that the North point of the one, must stick to the South point of the other, as I said; and not contrarily: for the South point applied to the South, and the North point to the North point, is contrary and the faculty will faint and decay at the preience of its Adversary. Nor yet will we omit to remember those that are curious to try this, that the Stones must successively be proportionable, that the great one must draw a less, and a little one must draw one less then it self: for so they will hang the faster, and not be so easily pulled asunder.

CHAP. XII.

That in the Loadstone that hairyness is contained.

Hence comes that hairyness of little Hairs, that we mentioned before, that sticks so fast to the Stone, that it can hardly be pulled off: for when one is rubbed against the other, or is beaten off with a light blow of the Hammer, those small pieces being rubbed one against another, do not fall to the Earth by their own weight, but are held up by the force of the Stone: and that one may stick fast to the other, turning its friendly countenance to it, it can by no other means commodiously fasten to its sympathizing part, nor be joynd with it, but like a Hair or small Thread; and if you rub one stone long against another, that heap of Sand will so augment, that it will appear all hairy, or like the down on a mans chin, or as it were beiter round with a heap of pricks. Nor is this to be passed without admiration, that if any man puts another Loadstone to it, or near it, that is greater then it, and more powerful; they will appear presently to turn about, and to direct their friendly parts to the like parts in the Stone that is put next them, and to strive to come to it; and if they cannot do it, for want of strength, they will fall to the ground.

CHAP. XIII.

The attractive part is more violent then the part that drives off.

WE must tell the Reader of another thing before-hand, that having laid the foundation of what we shall say, we may proceed to greater matters. The part that attracts, draws more vehemently; and that which drives away, doth it more faintly; namely, the part opposite to it: for if the South part of the Stone, stick to the North part of the other, it will draw at greater distance and more force: but contrarily, if you turn the disagreeing parts together, namely, the South parts to the South, and the North parts to the North parts, the natural force is made dull, and as though it were feeble and weak, it loseth its force, that it cannot so well perform its Office; and if they be not very near, the force is stopped, and can do very little. If any man desires to try, let him hang them up with threads, or balance them on a pin, or put them in Boats, and he shall finde their readines to draw, and their feebleness and sluggishness to drive off from them.

CHAP. XIV.

The contrary parts of the Stones are contrary one to another.

THE parts we speak of, if they be joynd friendly together, they will as it were, enter a league, and help one the other, and will gain more force and vertue. But if they be contrary, they are at such opposition by their Nature, and such secret hatred there is between them, that being put together by their disagreeing points, as if their Adversary were present, they will cease from all their attraction, and lose all their force. As, if you have Loadstones in your hands, that have the opposite parts united, the North and South together; if another Stone be put to them, neither of these Stones will move or get the Victory; for they neither draw to, nor drive from; especially, if both their forces be equal. But if one be stronger then another, the Stone that is put to it, will move and stir, and will either come forward or go backward. But if you take up his contrary Companion, he will either be drawn after, or will flee from it willingly; for it will either go along with the part it agrees with, or will go from that part it is contrary to: by which Reason you may know, that one hinders the other. We may also by another Experiment, be made more certain of the same thing: If you draw one Loadstone with another, and let it hang in the Air; if to the place where they joyn, you apply the contrary force of another Loadstone; by this meeting with their Enemy, both their forces will fail and faint: and if the same be of a great force, the Stone that drew will let the other go, and falls from it. And also, not without mirth and admiration, you shall see a Chain of many pieces of Loadstones hanging together; and if you apply the contrary side to the third or fourth Stone, the Chain is presently broken, and the part falls off, and will not hang fast: but the other parts, whether the force of it comes not, will yet stick fast together in a Link, unless you put the end of the contrary part to them.

CHAP. XV.

How to know the Polar points in the Loadstone.

WE may know by another and more certain way then that I set down before, which are the vertical points in the Loadstone, which turn to the North, which to the South; and especially, that point that sends forth the attractive vertue, will be discovered. Thus: That point that most vehemently draws unto it

the South point of another Stone, and sticks fast to it, that is the North point; and that point the North part of another Stone willingly joyns with, is the South point. The same also may be known by the driving off: That point that drives off from it, and refuseth the North part of the Stone put against it, is the North point; and the South point, that drives from it the South point. And he that would have the true pole more exactly demonstrated, let him do thus: Put a little bit of a Loadstone, not much greater or lesser then a Millet-Seed, to the Loadstone; and if it presently draw it at a distance, and when it is drawn, it sticks fast and is hardly taken from it, it is an Argument of the true end whence that force proceeds. You may also draw about a little bit about that point, to see if it will draw weakly or strongly, and whether it will part from that place of itself, or unwillingly. Briefly, That point that draws with most force, and will hardly let loose what it hath attracted, is the true point of attraction; giving you to understand,

That the Pole sends its force to the Circumference.

I have known it so, as from the Centre to the Circumference. And as the light of a Candle is spread every way, and enlightens the Chamber; and the farther it is off from it, the weaker it shines, and at too great a distance is lost; and the neerer it is, the more clearly it illuminates: so the force flies forth at that point; and the neerer it is, the more forcibly it attracts; and the further off, the more faintly; and if it be set too far off, it vanisheth quite, and doth nothing. Wherefore for that we shall say of it, and mark it for, we shall call the length of its forces the compass of its vertues.

CHAP. XVI.

That the force of drawing and driving off, can be hindered by no hindrance.

BUT this is above all wonder, that you can never wonder so much as you should, That the force of the Stone for attraction and repelling, can be included in no bounds, can be hindered by nothing, or held back; but it will penetrate invisibly, and will move and stir those Stones that are sympathizing with it, if they be put to it, and will exercise its forces, as if there were nothing between: but this must be within the compass of its vertue: for if you hang some Loadstone slyly upon a Table of wood, Stone, or metal, or lying equally balanced, and you shall put your Loadstone under the Table, and stir it there, the vertue of it will pass from this body like a Spirit penetrating the solid Table, and move the Stone above it, and stir it as it self is moved; as this moves, so moves that; and when this rests, that doth the same. But if the Table be made of Loadstone or Iron, the vertue is hindered, and can do nothing: we shall shew the reasons of it in their proper places. Of so many strange miracles in Nature, there is none more wonderful then this.

CHAP. XVII.

How to make an Army of Sand to fight before you.

AND it is as pleasant as wonderful, that I shewed to my Friends, who beheld on a plain Table an Army of Sand divided into the Right and Left Wings, fighting, to the wonder of the Spectators: and many that were ignorant of the business, thought it was done by the help of the Devil. I poured a Loadstone into powder, some very small, some something gross: and I made some of little bits, that they might better represent Troops of Horse, or Companies of Foot: and so I set my Army here and there. The Wings were on the Right and Left, and the main Body was in the middle, accompanied with Troops of Horse: under a smooth Table I put a very principal Loadstone with my Hand. When this was put there, the Left Wing marched; and on the Right Hand, with another Stone, the

Right

Right Wing marched : when they drew neer together , and were more neer the Loadstone , the Sands trembled ; and by degrees , they seemed like those that take up their Spears ; and when the Loadstone was laid down , they laid down their Spears , as if they were ready to fight , and did threaten to kill and slay : and the better the Loadstone was , the higher would these hairs stretch forth themselves : and as I moved my Hands by little and little , so the Army marched on : and when the Stones came neer to one the other , they seemed to fight , and run one within the other ; so the other Wings and Troops came on , and shewed the form of a Battle ; and you might see them sometimes retreat , sometimes march forward ; sometimes to conquer , and sometimes to be conquered ; sometimes to lift up their Spears , and lay them down again , as the Loadstone was put neer to them , or farther off ; and the more force there was to send forth every way . But this is the greater wonder , because what is done on a plain Board , may be done hanging in the Air , that you may see them like the Antipodes in Battel : for stretching out a Paper , or setting a Table aloft , the Loadstones moved above the Table , will do the same thing we speak of , and shew it to the Spectators . But if one that is ingenious do the business , he will do more and greater Feats then we can write of .

CHAP. XVIII.

The Situation makes the Vertues of the Stone contrary.

IT cannot want wonder , as it doth reason , That the position should shew the Vertues contrary to all that we have said : for the Stone put above the Table will do one thing , and another thing if it be put under the Table : for if you fit the Stone by equally positing it to make it move freely , or put it into a Boat , and put a Stone above it , it will attract it , or reject it , as we said before : but if you put it under the Stone , it will work contrarily ; for that part that drew above , will drive off beneath ; and that will draw beneath , that drove off above : that is , if you place the Stone above and beneath in a perpendicular . By which Experiments , one may see clearly , That the situation will work contrary operations , and change the forces of it by turns . Wherefore in the operations of it , you must chiefly mark the position , if you put the Loadstone above or beneath .

CHAP. XIX.

How the attractive force of the Loadstone may be weighed.

WE can also measure that attracting or expelling vertue of the Loadstone , or poise it in a balance : which will be of no small consequence in the following considerations ; and especially , for a perpetual motion , and to make Iron hang pendulous in the Air , when the true and certain attractive Vertue is found out from the Circumference to the Centre . The Art is this : Put a piece of a Loadstone into a balance , and in the other scale as much weight of some other matter , that the scale may hang equal : then we apply a piece of Iron lying on a Table , that it may stick to the Loadstone that is in the scale : and that they may stick fast by their friendly points , you shall by degrees cast some sand into the other scale , and that so long , till the scale and iron part ; so by weighing the weight of the sand , we have the Vertue of the Loadstone we sought to finde . We may also put the iron into the scale , and lay the Loadstone on the Table .

CHAP.

CHAP. XX.

Of the mutual attraction, and driving off of the Loadstone, and of Iron.

NOW are we come to the other part of our Treaty , wherein we discourse of the mutual union of Loadstones , and of their differences one with the other : the effects whereof are so known , that they are in the mouths of all men , nor will any man almost say that he knows them not . The operation is this : Because there is such a Natural concord and sympathy between the iron and the Loadstone , as if they had made a League ; that when the Loadstone comes neer the iron , the iron presently stirs , and runs to meet it , to be embraced by the Loadstone . And that embraceth it so fast , that with tossing of it up and down , you can scarce part them . And the Loadstone runs as fast to the iron , and is as much in love with that , and unity with it ; for neither of them will refuse to be drawn . But the weaker still runs willingly to meet the other . That you may believe this , you shall try it thus : Either hang them both by a thread , or put them in boats , or balance them on the needle . *Pliny* speaking of this , saith , For what is more wonderful ? or wherein is Nature more wanton ? what is more sluggish than a cold stone ? yet Nature hath given this both sense and hands . What is more powerful than hard iron ? yet it yields and submits : for the Loadstone draws it ; and that matter that conquers all things , runs after I know not what ; and as it comes neer , it stops , and lays fast hold , and stays constantly to be embraced : *Lucretius* , seeking the cause of this effect ,

How it should be that Loadstone Iron draws :

And *Orpheus* in his Verses relates , that iron is drawn by the Loadstone , as a Bride after the Bridegroom , to be embraced ; and the iron is so desirous to joyn with it as her husband , and is so sollicitous to meet the Loadstone : when it is hindered by its weight , yet it will stand an end , as if it held up its hands to beg of the Stone , and flattering of it , as if it were impatient that it cannot come at it by reason of its ponderosity ; and shews that it is not content with its condition : but if it once kiss the Loadstone , as if the desire were satisfied , it then is at rest ; and they are so mutually in love , that if one cannot come at the other , it will hang pendulous in the air . Wherefore *Albertus* very ignorantly told *Frederick* the Emperour , that a friend of his shew'd a Loadstone that did not attract iron , but was attracted by it ; since the lighter of these two will stir , when the heavier approaches neer it .

CHAP. XXI.

The Iron and Loadstone are in greater amity, then the Loadstone is with the Loadstone.

THE exceeding love of the Iron with the Loadstone , is greater and more effectual and far stronger , then that of the Loadstone with the Loadstone ; and this is easily proved : For lay on a Table , pieces of iron , and Loadstone of the same weight ; and let another Loadstone be brought neer ; when it comes to a fit distance , the iron will presently stir , and runs toward the Loadstone and embraceth it . And it is proved better thus : Let a Loadstone embrace a Loadstone , and be set softly neer the iron ; when the force of its circumference comes to the iron , the Loadstone will presently let fall the Loadstone , and lay hold on the iron : but let iron and that be joyned , no Loadstone can ever take them asunder to stick there .

CHAP. XXII.

The Loadstone doth not draw on all parts, but at certain points.

YE we must not think that the Loadstone draws the iron with every part , but at a set and certain point ; which is to be searched out , with great reason , care , and diligence .

diligence. You shall find it thus: either hang up the iron, or balance it on a Table, that it may presently leap to be embraced from them: then carry your Loadstone round about it; and when you see the iron tremble, and run toward the Loadstone, touching it, that is the very point of attraction, and the beams of its vertue are sent round about from that point: wherefore, the farther from that point the iron is, the more faintly and weakly will it move; for the more forcible vertue nests in the Centre, as in its Throne.

CHAP. XXIII.

That the same Loadstone that draws, doth on the contrary point drive off the iron.

That no man might be deceived, thinking the Loadstone that draws iron, to be different from that stone that drives it off; I tell him of it beforehand, and I shall by experiments dissipate this cloud. *Pliny* saith, the Loadstone that draws iron to it, is not the same with that which drives iron from it. And again, In the same Ethiopia, there is a mountain that produceth the stone Theamedes, that drives off iron, and rejecteth it. *Pliny* not knowing this, erred exceedingly, thinking that they were two stones that had these contrary operations; whereas it is but one and the same stone, that by sympathy and similitude, draws the willing iron to it; but with the opposite part, by antipathy of Natures, it drives it off. And you may be easily assured of this: for let iron be balanced equally, and let one end of the Loadstone draw it, if you turn the other end to it, it will fly back, and turn to the contrary part: these points run in a right line through the middle of the stone. Yet observe this, that the iron which is drawn by one point of the Loadstone, or is within the compass of its vertue for a while, obtains presently this vertue: that what is drawn by the one end of it, will be driven off by the other. You shall know these differences of attraction more clearly by the following experiment.

CHAP. XXIV.

How iron will be made leap upon a Table, no Loadstone being seen.

By reason of this consent and discord of the Loadstone, I use to make pretty sport to make my friends merry. For casting the iron on the Table, and not putting any Loadstone near it, that the spectators can see, the iron will seem to move it self: which is very pleasant to behold. I do it thus: divide a needle in the middle, cast one half of it upon the Table, but first rub the head of it with one end of the Loadstone. Put your hand with the Loadstone privately under the Table, and there where the head of the needle lyeth, the Loadstone will tick, and the needle will presently stand upright: and standing so, to the wonder of the beholders, will walk over the Table, and follow the motion of the hand that guides it: when it hath gone thus a while, presently turn the stone upside down, and put the contrary part of the Loadstone to the needle, and (which is strange) the needle will turn about: and if it went on the head before, it will now go on the point; and draw your hand which way you will, the needle will follow it: and if you turn the stone three or four times, putting sometimes the south point, sometimes the north point of the stone to it, the needle will turn as often, and sometimes stand on the head, sometimes on the point upright, or walk so as you please; and sometime it will go with that part it stood upon, sometimes it will stand on the part it went. I can present my friends with the same sight, in a more strange manner: for if you put the two pieces of a needle upon a paper or Table, whereof one hath touched the north point, the other the south point of the stone, I can so place two stones, that one of the needles shall go upon the head, the other upon the point; and sometimes one shall turn, then both at once, or they shall dance orderly, and move when any musick is playd on. And this is a pretty sight to shew your friends, that cannot but admire it.

Chap.

CHAP. XXV.

That the vertue of the Loadstone, is sent through the pieces of Iron.

That vertue that is imparted to the iron, by the Loadstone, doth not stay in the iron, but is sent from one to another. For if you draw a steel needle by the touch of the Loadstone, and put another needle to the end of that needle, that part will draw the needle, and hold it hanging in the air; and if you apply another needle to that, it will do the same.

You may do this with as many needles, as the force of the Loadstone can reach unto; but when it grows faint, the needle will let the other needle fall, as not having strength enough to bear its weight. And thus you may hang a great many needles in a chain in the air. *Plato* knew this vertue, for he speaks of it in Ions: which stone, not onely draws iron rings, but insueth vertue into the rings themselves, that they can do the same, and attract rings as the one doth: whence sometimes you shall see a long concatenation of iron rings, and all the vertue of them is attracted from that stone. *Lucretius* knew it also.

*A Stone there is that men admire much,
That makes rings hang in chains by touch.
Sometimes five or six links will be
Fast joyn'd together, and agree.
All this vertue from the Stone ariseth,
Such force it hath —*

Pliny speaking of the same vertue, saith, Onely this matter receives strength from another stone, and holds it a long time; laying hold of another iron, that sometimes you shall see a chain of rings, which the ignorant vulgar call Live iron. *Galen*. You may see in the Loadstone, that when it toucheth iron, it will stick to it, without any bands: and if that was first touched, touch another, that will stick as the first doth; and likewise a third to the second. *Augustine de civitate D. i.* speaking of this wonder, said, We know that the Loadstone will wonderfully draw iron, which when I first saw, I trembled at it exceedingly. For I saw an iron ring drawn by the stone, that hung in the air by it, that communicated the same force to others: for another ring put to the first, made that hang also; and as the first ring hung by the stone, so the second ring hung by the first ring. In the same manner was there a third and fourth ring applied, and fastned; and so their rings hung together by the outides, not fastned inwardly, like to a chain of rings. Who would not admire at the vertue of this stone? that was not onely within it, but ran through so many rings, that hung by it, and held them fast with invisible bands. But the greater the vertue of the Loadstone is, the more rings it will hang up: I have hang'd ten needles with a stone of a pound weight. But he that would draw many needles, let him rub the heads onely against the Loadstone, and they will all hold the heads by their points.

CHAP. XXVI.

The Loadstone within the sphere of its vertue, sends it forth without touching.

And the Loadstone doth not onely impart its vertue to the iron, by touching it; but, which is wonderful, within the compass of its vertue, it will impart vertue to the iron, if it be but present, to draw another iron. For if you put your Loadstone so near to the iron, that it may have it onely within the circumference of its vertue, and you put another iron near to that iron, it will draw it to it; and if another touch that which is drawn, it will draw that also: that you shall see a long chain of rings or needles, hanging in the air. But when they hang thus together, if you

remove the Loadstone a little farther off, the last ring will fall; and if yet you remove it farther, the next will fall, until they all fall off: whence it is clear, that without touching, it can impart its virtue to the iron.

CHAP. XXVII.

How the Loadstone can hang up iron in the air.

I Have a long time endeavoured much to make iron hang in the air, and not touch the Loadstone, nor yet tied beneath: and now I think it almost impossible to be done. *Pliny* saith it: *Dionocrates* the Architect began to vault the Temple of *Arminoe* with Loadstone, that therein her Image of iron might seem to hang in the air: both he and *Proton* died, who commanded this to be made for his sister; so that what he began, he did not finish. The Greeks say, that in the Temple of *Serapis*, that is vaulted at *Alexandria*, there was a Loadstone set, that held statues of brals in the air; for it had a piece of iron in the head of it. But that is false, that *Mabomet*'s chest hangs by the roof of the Temple. *Petrus Pellegrius* saith, he shewed in another work how that might be done: but that work is not to be found. Why I think it extream hard, I shall say afterwards. But I say it may be done, because I have now done it, to hold it fast by an invisible band, to hang in the air; onely so, that it be bound with a small thread beneath, that it may not rise higher: and then striving to catch hold of the stone above, it will hang in the air, and tremble and wag it self.

CHAP. XXVIII.

The forces of the Loadstone cannot be hindered, by a wall or table coming between.

AS I said before of the Loadstone, the virtue of that and iron, can be hindered by no body coming between; but it will do its office. For whilst the Loadstone is moved under a Table of wood, or any metal, except iron; the needle in the Mariners Compass will move above, as if there were no body between them. *St. Augustine Lib. de civitate Dei*, knew this experiment. But that is much more wonderful, that I have heard: that if one hold a Loadstone under a piece of silver, and put a piece of iron above the silver, as he moves his hand underneath that holds the stone, so will the iron move above; and the silver being in the middle, and suffering nothing, running so swiftly up and down, that the stone was pulled from the hand of the man, and took hold of the iron.

CHAP. XXIX.

How a man of wood may row a little Boat; and some other merry conceits.

THE fraud here is notable; for women shall see a man of wood rowing a little boat well waxed, in a large vessel full of water, and they can counterfeit hereby, as impostors do divination by water. The fraud is thus began: the vessel is filled with water, a little slip of Wax is put into it, or else of wood; in the middle sits a little man of wood, fastened through the middle with a hogs-bristle, so equall balanced, that with every light motion he may easily stir himself: let him have oars in his hands, and under his feet a piece of iron. Let the Alphabet be made on the brim of the vessel, round about: wherefore a woman coming to enquire of some doubtful matter, the little man of wood; as if he would give a true answer, will row to those letters that may finish the answer: for he that holds the Loadstone in his hand, under the Table, can draw the boat which way he will, and so will answer by joining these letters together. Or put a boy of cork into a glass viol, with a broad mouth, that turns himself about the needle equally balanced; and about the glass vessel, make the Alphabet, that the man turning round about may give answers. But I made my friends wonder exceedingly to see

A paper go up a wall, and come down of it self.

For I glew'd a piece of iron on the backside of the paper, and I gave it my friends to hold to the wall; but behinde stood a boy with a Loadstone, and the paper that was left there, stood still: my friend commanded it to go up two foot: the boy that heard what was commanded, moved the Loadstone against it, to that place: and the paper moved thither also, and so downwards, or side-ways: they that knew not the reason were astonished at it. But, which exceeds all, when he moved the Loadstone over his head, by an arch of wood, it drew the paper after it; whereupon the paper hung over our heads and moved: but all that saw it, believed the Devil was the cause of it.

CHAP. XXX.

A Loadstone on a plate of iron, will not stir iron.

WE said that there is nothing coming between, can hinder the force of iron, but iron onely: so that if you lay a needle on a plate of iron, and shall bring your Loadstone to it, above or beneath, it hath no vertue to attract it, or do its office: and the reason is easie. For it stands by reason, that if iron lye upon iron, they are the same body, as a part is of the whole: and when the plate of iron, or piece, is bigger, and too heavy for the Loadstone to draw, it moves not. So that if you put the filings of iron upon a plate of iron, and with your hand underneath, you carry the Loadstone, the filings will not stir, but stand still upon the plate. Nor if iron or a Loadstone be upon a Table of iron, will they come to the stone that is put to them, but will lye as if they were asleep, and void of all vertue, or changed in their Natures. Also, if you put flat iron to a Loadstone, if on the other side iron be equally balanced, it will not stir, nor move to meet it; as if all the force of the Loadstone were hindered by it. *Lucretius* saith, that it will happen so, not when iron, but brals is between them: but I rather think he writ so by hear-say, then by his sight, if we understand his meaning.

*Pieces of iron I have seen,
When onely brals was put between
Them and the Loadstone, to recoil:
Brals in the middle made this broil.*

CHAP. XXXI.

The position of the Iron, will change the forces.

WHAT the Loadstone can do, the iron touched by the Loadstone, will do the same. I said, that the Loadstone equally balanced, by putting the south part of the Loadstone above, it will draw the north part, and the north part will drive off the north part; but on the lower part, the Nature being changed, that which drew before, drives off now; and that which drove off, draws to it. The same I judge of iron touched with the Loadstone. For iron in the Mariners Compass touched with the Loadstone, that part of the Loadstone that draws and drives off in the upper part, being put under, expels what it drew before, and draws what it expelled. I would not omit, that amongst its admirable properties, the position should cause such alteration. Whence we may conjecture, that as the stone hath a pole-ardick and antardick; so it hath an east and west part, and its upper and nether part, as the heavens have: and therefore it is reasonable, that whereas the north and inferiour part from above, drew the south and inferiour part of the iron; now the position being changed, the upper part of the stone will draw the nether part of the iron.

CHAP. XXXII.

That the iron rubbed with the northern point of the Loadstone, will turn to the south, and with the south point to the north.

I Come to the third part, that is, to the iron touched with the Loadstone, and they are all wonderful. I say then, that when we know the north point of the stone, and we have rubbed one end of the iron with it, if it be equally balanced, or hung by a thread, or lie freely in a boat, it will turn of it self to the south. And that stands with reason: for the Loadstone imparts its force to the iron. For it is the natural force of the Loadstone, that being balanced equally, it should turn its north point to the north, and his south point to the south. But when it is rubbed on the iron, the upper part of the Loadstone is fastned to the iron; but the lower part that is near to it, is free'd: wherefore, if you rub the iron with the north part, which fastneth to the iron, and toucheth its external superficies, it will be northern that seems to be southern, and this south part will turn freely to the north. But contrarily, if you rub the south point against the iron, the south point is fastned to the iron, and the north point is let loose that turns to the north. Wherefore *Cardanus* speaks false, that the iron touched by the north point, will turn to the north, and that which was touched by the south point, will turn south; for we see the contrary. Yet the iron must be touched with one point, either the north or south point: for if one part bend northward, the other will tend southward; by the use whereof, so large seas are sail'd over, that being the conductor. Our Ancestors sail'd, by seeing the sun by day, and the stars by night. For in the middle of the sea, as they wandred, they could no otherwise see the coasts of the world. But we cannot openly discover what coast we are in, but we can avoid the rocks under the waters; and in cloudy days and dark nights, we can at all times know the poles of the world. *Flavius* saith, an Italian found it our first, whose name was *Amalpinus*, born in our Campania. But he knew not the Mariners Card, but stuck the needle in a reed, or a piece of wood, cross over; and he put the needles into a vessel full of water, that they might float freely: then carrying about the Loadstone, the needles would follow it; which being taken away, as by a certain natural motion, the points of the needles would turn to the north pole; and having found that, stand still. Wherefore, knowing the place before they steer'd their course thither. Now the Mariners Compass is made, and a needle touched with the Loadstone, is so fitted to it, that by discovering the pole by it, all other parts of the heavens are known. There is made a rundle, with a Latin-navel upon a point of the same metal, that it may run roundly freely. Whereupon, by the touching onely of one end, the needle not alone partakes of the vertues of it, but of the other end also, whether it will or not: For if you rub the needle with the north point of the stone presently that part will turn to the south, and the opposite part to the north; and one vertue cannot be imparted without the other. So the needle touched by the south point of the stone, will turn to the north, and the other part to the south; so that the part of the needle that is touch'd, receives a contrary force, from that the stone hath.

С Н А Р. XXXIII.

That iron touched by the Loadstone, will impart that force to other iron.

IRontouched by the Loadstone, by that touch receiveth the vertue of the Loadstone, that it will do almost as much by attracting, and effecting, and turning it self to the pole. So the iron hanging freely, touched with the fourth point of the Loadstone, will turn freely to the north: if you apply the fourth part of the stone to the same, it will turn to the south presently. But if you touch another iron with the iron that was touched, that will turn to the south; and do but point at it with the said

said point of the iron, it will turn to the north. And this force is not onely sent into the second iron, but to a third and fourth, as the force of the Loadstone is. For if it be a strong stone, it will send its vertue through eight or ten needles.

С Н А Р. XXXIV.

The vertue received in the iron, is weakened by one that is stronger.

YET this I muſt tell you, that the virtue received by the iron, is not fixt and certain, but is taken off by a ſtronger that takes it from it. As an iron touched by a weak northern point of the Loadſtone; if you rub the ſame part of the iron with a ſouth point of a ſtronger Loadſtone, it will vaniſh, and that former force of turning it ſelf to the ſouth, is taken away, and it takes a ſouthern virtue, and will turn to the north without reſiſtance. But if the Loadſtones be of equal force, they are ſo aſtoniſhed and blunted, that they will neither receive both, nor either.

CHAP. XXXV.

How in a stone the south or north point is discerned.

Amongst those ways I shewed before, I shall set down this also; and perchance this is the best, how to know the true northern and southern points. Let the Loadstone be turned round, by the wheel of the Jewellers, and polished, Then make a slender iron, as long as the axle of that round ball, and lay that upon the stone: for it will turn itself upon that line, that points just north and south. Mark the line upon the Stone, with some delicate paint: do the same on the other side of the stone; and where it rests upon the ball, draw the same line: do the same the third and fourth time, upon the middle of it: and where those lines cross one the other and meet, those are the polar points. We may also find it out thus: Break a small needle, and put the smallest piece upon the same ball, and stir it; for when it comes to the just northern point, the needle will stand upright, that will make standers by admire, and will stand perpendicularly upon it: and till it do rise thus, be not weary of moving it up and down; for when you have found it, you will be glad of it.

CHAP. XXXVI.

How to rub the iron needle of the Mariners Compass.

I Know that some are troubled how to rub the needle in the Compaſs with the Loadſtone, that it may get force to turn it ſelf to the north Pole. It muſt be done thus: When you have found the points in the ſtone, as I ſaid before; ſtrike the points lightly with a hammer, and the places will be full of ſtiff hairs: upon which if you rub an iron needle, it will preſently get vertue to turn it ſelf to the Poles. Yet obſerve this, that if you would have your needle turn to the north, you muſt rub it on the fourth point; but if to the ſouth, rub it with the north part: For when it is equally balanced, it will turn to theſe points in the heavens. But that it may do it more forcibly, and do its office more exactly, I ſhall lay down ſome rules fit to inſtruct you. If you ſtrike both ends of the ſtone with the hammer, that hairs may appear on both parts, that you touch the needle at both ends, for ſo the needle will ſooner do its office. Moreover, you muſt obſerve very carefully, that when the iron rub'd againſt the Loadſtone, hath received theſe hairs, that you touch it with no other iron or Loadſtone, but keep it far diſtant from them, and lock it up in a box; for by touching of others the iron will grow dull, and loſe its vertue: that it will never point out the parts of heaven perfectly. For the iron coming within the Compaſs of the vertue of another Loadſtone, will receive that, as we ſaid. So the needle muſt be proportionable to the ſtone. For from a little Loadſtone, a great iron

iron will not receive much vertue, nor shew the pole: also, a little piece of iron cannot receive much vertue; for it consumes by the great force of the Loadstone. Moreover, the point that shews the pole, must not be sharp, but flat a little, that it may receive those vertues of the Loadstone exactly, and hold them; for in a very sharp point, scarce any vertue will abide. Iron, the purer it is, the better will it hold the vertue. For it will hardly take upon foul and rusty iron: wherefore Mariners make it of pure steel; for steel is made of the best iron. If you observe this, iron once rubbed, will hold the vertue a hundred years; and will certainly, without failing, point exactly at the poles in the heavens, for so long time.

CHAP. XXXVII.

Of the divers uses of Mariners Compasses.

AND the needle touched, doth not onely shew the poles for the Mariners use, but almost it serves for infinite uses; as all men know that it is daily spoken of every where. I shall speak of some of the chief. The use of the Loadstone upon the needle, is well known in Sun-dials: for when the needle stands still over the line that is made from north to south, we are so directed by it, to know the hours by the shadow falling from the Gnomon. Also, those that work in Mines use the needle, to find the veins of the metals, which way they run: for in caves under ground, in that posture the needle stands that is touched with the Loadstone, they know the veins of the metals run on that side of the heavens. Also, it doth serve very much for those that describe platforms of buildings, cities, countries, whilst the situation of the corners are taken and described upon the paper. We use it also in making passages, for to bring water under ground, in digging pits, in making Mines and Trenches, wherewith they use, with great skill, to blow up Forts, Castles, Rocks and Walls, by putting Gunpowder into them, and stopping all places of vent: the Compass guides them how to go on. Lastly, how to level the discharging of Canon, both by night and day, it is of singular vertue, and for many other uses, too tedious to relate here.

CHAP. XXXVIII.

How the Longitude of the world, may be found out by help of the Loadstone.

I Will not omit, that amongst the principal uses of the Loadstone, by the help of it the Longitude of the world may be found out. Which notable work hath employed the wits of the most knowing men. It hath been observed a long time by our men, that the needle touched with the Loadstone, will not always rest upon the Meridian line, but sometimes will decline nine degrees from it to the east; nor will it hold the same posture in all places; but in divers places, it hath divers declinations. But this error seems to follow this order, that the nearer it is to the east, the more it will decline from the Meridian line, toward the east; and the nearer it comes to the west, the point of the needle will decline the more to the west. For finding the Meridian line, as *Ptolemy* and other Geometricians teach how, and setting up a point thereon, that the steel needle may turn freely upon the top of it, in Italy it declines toward the east nine degrees, of which there is ninety in a quadrant of a circle, as it is observed in Sun-dials that are brought out of Germany, and it is so described. Moreover, many famous travellers report, that amongst the Fortunate Islands, one is called the Azores; where the needle set in the Compass, will rest directly upon the Meridian line, without any variation at all. Also, they that sail to the west-Indies observe, that the point of the needle will decline to the west. Therefore, laying down these for true Maxims, we may easily know the longitude of the world: for if we make a very great Compass, about five foot diameter, and divide the degrees and minutes, into seconds and thirds, &c. and

and sailing under the Equator, we do observe the chief motions of the Needle, and the declinations of it, and shall accommodate the same to the proportion of our Voyages; we shall easily know the Longitude of the World, beginning from the Fortunate Islands. Whence both Longitude and Latitude in dark nights, and the greatest Tempests may be certainly discovered. Wherefore it is false that *Cervantes* saith, That the Needle in the Compass declines from the Meridian Line, because it inclines to the Pole Star in the little Bears Tail: whereas, the Needle declines nine Degrees, and the Polar Inclination is not so much.

CHAP. XXXIX.

If the Mariners Needle stand still, and the Loadstone move, or contrarily, they will move contrary ways.

IF the Loadstone lie on the Table, and you put the North point of the Mariners Needle to the South point of the stone, and shall carry it round about by the right hand, the Needle will draw to the left: but moving the Box to the left hand, the Needle will run to the right; and it will go so far, until it stand in the middle between those two opposite points. The same will be seen in a Sun-Dial, if that stand, and the Loadstone be carried about: for if you decline to the right hand, the Needle will follow the same part; and likewise, if you turn to the left. Hence it is apparent, That the Needle in the Compass is drawn by the North-Pole: for those that sail toward the East, have it turned toward the East; and so contrarily to the West, it will move to the same point of the Heaven: and if the Loadstone be turned about, the Iron will turn about also, as a pair of Compasses about the Centre.

CHAP. XL.

The Loadstone imparts a contrary force to the Needle.

NOW I will speak of the Needle touched with the Loadstone, and of the wonderful operations of it. The first is; That when the Iron is touched by the Northern point of the Loadstone, and equally balanced; if you put that part to it from which it received its force, it will not endure it, but drives it from it, and draws to it the contrary and opposite part; namely, the Southern part: the reason whereof, I set down before. The same falls out if you touch the Needle with the South part of the Loadstone: for if you presently put the same to it, it will resist it, and draw to it the North point. Hence the parts that are alike, are at enmity, and rejected as Adversaries; and the parts that are unlike do agree as Friends. Whence it is apparent, That the Loadstone imparts to the Iron a contrary force from what the end it self is, and the Steel receives the force of that point of the Loadstone which it toucheth not. And I prove it thus: Take two Needles, and put them in Boats, or hang them by Threads; that being touched with the Loadstone, they may move freely: they are contrary one to the other, and they will joyn in the parts that were touched with contrary ends of the Loadstone, and will not endure the ends that are alike.

CHAP. XLI.

Two Needles touched by the Loadstone, obtain contrary Forces.

I Will relate a strange thing, yet not far from Reason. If you touch two Needles with a Loadstone together, and set them on the same point of it; the other parts that hang on the Loadstone, will abhor and flee one from the other: and if you force them together with your hands, so soon as you let them alone, they

will presently return to their postures, and depart as far as they can from one another. The reason is this: That if two Needles stick fast to one Northern point of the Loadstone, with their points: you must imagine, that they did receive a Southern virtue; and because they are of the same similitude, they will not endure one the other; and because they are fastened to the Loadstone, they cannot get off being compelled by a greater force: but the opposite points of the Needle, because they are both alike Northerly, they must needs abhor one the other: and when they are free, one will part from the other. And when they are so hanging on, if you put to them the Southern part of another Loadstone, they will presently let go their hold, and go as far off as they can, that sometimes they are pulled off from the Loadstone, being forced by an invisible vapor.

CHAP. XLII.

That the force of the Iron that draws, will drive off Iron by diversity of Situation.

THat, as I said of the Loadstone alone, is true of the Iron that is touched with it: for if you put a Needle touched with a Loadstone by a Boat, swimming in the Water, or hanged by a Threed, or turning on a point equally balanced: if you put upon this a Needle touched with a Loadstone, it will draw it: and that part that attracted the Iron above, will put underneath, drive it away; and the part that drives off above, will draw to it, put underneath: where you may observe, that the position will work contrary operations.

CHAP. XLIII.

The Needle touched by the Loadstone on one part, doth not always receive Virtue on both parts.

IF the Needle be touched at one end by the Loadstone, it receives Virtue at that end; and at the other end, the contrary virtue: But that must not be understood absolutely, but of that Needle that is of a proportionable length: for if it be too long, the virtue will not come to the other end. But would we know how far the virtue is come, we must know how far reached the Circumference of the Virtue, as I said. Therefore if the Circumference of it be a foot, the force will go a foot-long into the Needle. If we would try this: Touch a long Needle three foot long with a Loadstone at one end, if it touch the Iron at the other end, the Iron touched will not move from its place; but if you touch it a foot or two long, namely, as far as the Circumference of the Loadstones Virtue will reach, and then touch the Needle, it will presently move and be drawn by it.

CHAP. XLIV.

The Needle touched in the middle by the Loadstone, sends forth its Force at both ends.

IF the Needle be somewhat too long, and we rub it with the stone in the middle of it, the forces of the stones part are diffused to both ends of it; but very obscurely; for you shall not know which is the end: but if you touch it something farther from the middle, the nearer part will receive the forces of the part that touched it, be it the Northerly or Southerly part.

CHAP.

CHAP. XLV.

An Iron Ring touched by a Loadstone, will receive both Virtues.

BUT if we rub an Iron Ring on the one side with a Loadstone, then the part that is touched, will receive the virtue of the part of the Loadstone that touched it, and the opposite part will receive the contrary: and therefore the middle of the Iron Ring will be capable but of half the force of it, as if it were straight. But if we make a Pin round as a Ring, and the part joyned together with a joynr, be rubbed with a Loadstone; and being rubbed, be stretched straight again, the ends shall receive the same virtue, be it Northern or Southern. But by degrees that force will grow feeble; and in a short time become Northerly, and the other Southerly, or will receive more virtue then it first had, may be when it was touched farther from the end. But if you would, that of these a Chain of Iron should hang in the Air, so soon as one ring touched on one side with the Loadstone, hath received force on the other side by it, we may hang a Chain of Rings in the Air, as we may of Loadstones: so then, if the Rings be laid in order upon a Table, that they may one touch the other, though they do not fasten, put the Loadstone to them, and not onely the first will be drawn, but the next, and the third, that they will hang like links of Rings: and not only will it be so, if the Loadstone touch the first, that the rest will follow; but if the stone be but neer, it will do the same without touching them.

CHAP. XLVI.

An Iron Plate touched in the middle, will diffuse its forces to both ends.

WHAT I said of a long Needle, I say also of an Iron Bar: for if you touch it in the middle, the Beams of it are spread like the Beams of the Sun, or light of a Candle, from the Centre to the Circumference, and extrem parts. But if we touch an Iron Morter, being the force is feeble, where it is touched about the superficies, some virtue may be perceived; but it is very weak in the extrem parts.

CHAP. XLVII.

How filings of Iron may receive force.

IF you wrap up filings of Iron in a paper, as Druggists do, like a Pyramis; and put a Loadstone neer it, all the filings together will receive the same force, as a long piece of Iron doth: but if you stir the filings, and put them into an open paper, that force is lost, and confounded, and can do nothing, as if it had never been touched, by reason of so many different pieces.

CHAP. XLVIII.

Whether Garlick can hinder the virtues of the Loadstone.

NOW I shall pass on to other properties of the Loadstone: and first, whether the Loadstones attraction can be any ways hindered. *Pimarch* saith, That Garlick is at great enmity with the Loadstone; and such antipathy and hatred there is between these insensible Creatures, that if the Loadstone be smeared with Garlick, it will drive away Iron from it. *Ptolomy* confirms the same, That the Loadstone will not draw Iron, if it be accompanied with Garlick; as Amber will no more draw straws, and other light things to it, if they be first steeped in Oyl. It is a common Opinion amongst Sea-men, That Onyons and Garlick are at odds with the

Loadstone: and Steers-men, and such as tend the Mariners Card are forbid to eat Onyons or Garlick, lest they make the Index of the Poles drunk. But when I tried all these things, I found them to be false: for not onely breathing and belching upon the Loadstone after eating of Garlick, did not stop its vertues: but when it was all anoynted over with the juice of Garlick, it did perform its office as well as if it had never been touched with it: and I could observe almost not the least difference, lest I should seem to make void the endeavors of the Ancients. And again, When I enquired of Mariners, whether it were so, that they were forbid to eat Onyons and Garlick for that reason; they said, They were old Wives fables, and things ridiculous; and that Sea-men would sooner lose their lives, then abstain from eating Onyons and Garlick.

CHAP. XLIX.

How a Loadstone astonished may be brought to it self again.

IF a Loadstone be drunk, and do not its office, not as we said, by being breathed on by Garlick, but rather by reason of some other parts of the Loadstone that had touched it, so that the vertue of it is decayed and gone; we shall restore it to its former vertue, by covering it over with the filings of Iron many days, until, by the vapors or company of the Iron, it can perform its office as it should.

CHAP. L.

How to augment the Loadstones vertue.

HERE are many learned men that have attempted to augment the Loadstones vertue, and that divers wayes, that having got more forces, it might serve for very great uses. *Alexander Aphrodisens* in the beginning of his Problems, enquires wherefore the Loadstone onely draws Iron, and is fed or helped by the filings of Iron; and the more it is fed, the better it will be: and therefore it is confirmed by Iron. But when I would try that, I took a Loadstone of a certain weight, and I buried it in a heap of Iron-filings, that I knew what they weighed; and when I had left it there many months, I found my stone to be heavier, and the Iron-filings lighter: but the difference was so small, that in one pound I could finde no sensible declination; the stone being great, and the filings many: so that I am doubtful of the truth. *Paracelsus*, being skilled in distillation, tried to do it another way: For (saith he) if any man shall quench often in Oyl of Iron, a Loadstone red hot, it will by degrees recover force, and augment so much, that it will easily pull a Nail forth that is fast in a Wall: which conceit pleased me well; and thereupon I made the stone red hot, and quenched it often in Oyl of Iron: but it was so far from getting more strength, that it lost what it had: and fearing I had not done it right, I tried it often; so I found the falsity of it, and I warn others of it also. For a Loadstone made red hot in the fire, will lose all its vertue, as I shall shew afterwards.

CHAP. LI.

That the Loadstone may lose its vertue.

I Found out, That this is the onely true way, amongst many that are set down by Writers, by heaping Fire-coals upon the Loadstone: for once made red-hot, it presently loseth all its vertue, and a vapor flies from it that is blewish black, or Brimstone-like, smelling strong, as Coals do; and when that flame and vapor ceaseth to exhale, if you take it out of the fire, all the force of it is breathed forth: and I always thought, that that was the Soul of it, and the cause of its attraction of iron: whereas iron is made of Brimstone not perfect; as I read in *Selen* and other Writers

Writers that treat of Metals: which is the cause that it runs so swiftly to the Loadstone, and desires so much to be embraced by it: and when that vapour is gone from the stone, it loseth all its vertue; and then it is but a dead carcass, and it is in vain to endeavour to revive it.

CHAP. LII.

How the Iron touched with the Loadstone loseth its force.

THE same way the Loadstone doth, the iron loseth its force also: for though it have been excellently well touched by the Loadstone, if you heat it red-hot in the fire, it will lose its forces: and the reason is; because that part of the Loadstone that cleaves to the iron, loseth its forces in the fire; and therefore the iron deprived of that, loseth the force also. Wherefore in the Mariners Compass, or in other uses, when the iron is stupified by the touch of other things, and hath not its due forces to free it from this imperfection, we put it into the fire. Hence we finde the error of many men, who when they put the Needle into the Compass, they first make it red-hot, and then they rub it with the Loadstone, supposing it will by that means, take in the Loadstones vertue the more: but they do not onely by contraries, but they so make void the Loadstones vertues, that it cannot do its office, but that force is driven out of the iron by the fire; and it is just as it was before it was touched with the Loadstone. Wherefore, as often as that force is driven away with the fire, we may touch it again, and give it the same force.

CHAP. LIII.

It is false, That the Diamond doth hinder the Loadstones vertue.

WE shewed that it was a false report, that the Loadstone anoynted with Garlick, loseth its vertues. But it is more false, that it loseth its vertue by the presence of the Diamond. For, say some, there is so much discord between the qualities of the Loadstone and the Diamond, and they are so hateful one against the other, and secret enemies, that if the Diamond be put to the Loadstone, it presently faints and loseth all its forces. *Pliny*. The Loadstone so disagreeeth with the Diamond, that if Iron be laid by it, it will not let the Loadstone draw it; and if the Loadstone do attract it, it will snatch it away again from it. *St. Augustine*. I will say what I have read of the Loadstone: How that if the Diamond be by it, it will not draw iron; and if it do, when it comes neer the Diamond, it will let it fall. *Martibodem* of the Loadstone:

All Loadstones by their vertue Iron draw;

But of the Diamond it stands in awe:

Taking the Iron from't by Natures Law.

I tried this often, and found it false; and that there is no Truth in it. But there are many Smatterers and ignorant Fellows, that would fain reconcile the ancient Writers, and excuse these lyes; not seeing what damage they bring to the Commonwealth of Learning. For the new Writers, building on their ground, thinking them true, add to them, and invent, and draw other Experiments from them, that are faller then the Principles they insisted on. *The blinde leads the blinde, and both fall into the pit*. Truth must be searched, loved and professed by all men; nor must any mens authority, old or new, hold us from it. But to return from whence those Reconcilers idleness drew me: I took a piece of a Loadstone to try by; it was hardly four Grains in weight: I fastned the filings of iron very fast to it; then I put the Diamond that was three or four times bigger then them both; but that would not make the Loadstone forsake the iron: then I took off the filings of iron from the Loadstone, and

and set them at a just distance, and it drew the filings to it, though the Diamond were by. I say this, lest they should think I failed in the trial, and to have taken a Loadstone of twenty or thirty pound weight, and fastened an ounce of iron to it, and then to have taken a very small Diamond, and put it to them to make trial with.

CHAP. LIV.

Goats blood doth not free the Loadstone from the enchantment of the Diamond.

I said, That from false Principles, are drawn most false Conclusions. Also I said, That it is related that the juice of Garlick smeared on the Loadstone, will take away its attraction of iron; and, That when the Diamond is by, it will not draw iron, or will let it fall. But because (say some) Goats blood will break the Diamond, if the Loadstone be anointed with Goats blood, it will recover. *Cassianus in Geoponic. Graec.* The Loadstone draws iron to it, and again drives it away from it, if it be anointed with Garlick: but that the force almost lost may be restored, it must be washed in Goats blood. *Rhemius the Interpreter of Dionysius.*

*'Gainst which, nor fire, nor steel ever won;
Goats blood if warm, can break the Diamond:
Nor strokes o' th' Hammer can consume this Stone,
Which from the Loadstone doth the Iron take,
That it would still embrace it, let alone:
Diamonds, Loadstones virtues empty make.*

Marbodens of the same.

*A Diamond is mighty hard: a Stone
That on the Anvil never can be broke;
Nor steel, nor fire hurt it, yet 'tis known,
It crumbles in Goats blood, if laid to soak.*

Since therefore there is an Antipathy between the Diamond and the Loadstone; and there is as great Antipathy between the Diamond and Goats blood, as there is sympathy between Goats blood and the Loadstone; We are from this Argument proceeded thus far, that when the virtue of the Loadstone is grown dull, either by the presence of the Diamond, or stink of Garlick, if it be washed in Goats blood it will then recover its former force, and be made more strong: but I have tried that all the reports are false. For the Diamond is not so hard as men say it is: for it will yield to steel, and to a moderate fire: nor doth it grow soft in Goats blood, or Camels blood, or Asses blood: and our Jewellers count all these Relations false and ridiculous. Nor is the virtue of the Loadstone, being lost, recovered by Goats blood. I have said so much, to let men see what false Conclusions are drawn from false Principles.

CHAP. LV.

The Iron touched with a Diamond will turn to the North.

But this is most true, that I found out by chance when I made trial, whether the Diamond had any forces to weaken the Loadstones virtue, as I said: for if you rub a steel-Needle on a Diamond, and then put it into a Boar, or thrust it through a reed, or hang it up by a Thread, it will presently turn to the North, almost as well as if it had been touched with the Loadstone; but something more faintly. And, what is worth noting, the contrary part will turn the iron to the South:

South: and when I had tried this in many steel-Needles, and put them all into the Water, I found, that they all stood equidistant, pointing to the North. And if they that write, That the Loadstone is weakened by the presence of the Diamond, had written thus, they had said more Truth: for a Needle rubbed on a Diamond, and stuck in a straw, and put into the water, that it may turn freely; being turned with your finger, when it stands still, it will turn North, and point at it exactly.

CHAP. LVI.

The forces and remedies of the Loadstone.

Our Ancestors invented many things, by reason of this admirable attractive operation of the Loadstone, and found out many remedies that are worth observing. From this drawing quality that it allures iron to it, and that they mutually attract the one the other; they did attribute unto it an understanding of venerious actions, and that they are one in love with the other; nor will their mad love abate, till they embrace each one the other: and when they turn their backs, they hate one the other, and drive one the other off; and that they contain in them also the Principles of hatred. *Marbodens.*

*This Stone doth reconcile the man and wife,
And her recal that from her husband goes:
If one would know her leads a whorish life,
Under her head, when that she sleeps, it shows:
For she that's chaste, will presently embrace
Her husband whilst she sleepeth; but a whore
Falls out o' th' bed, as thrown out with disgrace,
With stink o' th' Stone, which shows this, and much more.*

And for this cause, our Ancestors to signify as much, did oft-times engrave the picture of Venus upon the Loadstone. Hence *Claudian* writes,

The Loadstone Venus oft-times represents.

I remember also, that many of the Ancients reported, That if a Loadstone were beat into powder, and were strewed into burning Coles, about the corners of the house, that the smoke might fly up; those that are in the house, will presently run out for fear the house will fall; and frighted with these phantasies, would run, forsaking all their houses: and thus Thieves may steal all their Goods. *Marbodens.*

*If that a Thief can creep into a House
That's full of wealth, and Treasure hath good store;
Let him on burning Coles, before he rowse
The people, strew the Loadstone dust all ore,
That so the Smoke may at each corner rise,
And that will make the people wake, and think
The house will fall, and run out with great cries,
Then may he take away their Gold and chink.*

The reason is, Because the Loadstone is melancholick, as you may conjecture by the colour of it; the fumes whereof, rising into the brain, will cause those that are asleep to have melancholick phantasies presented unto them: and Coles will do the like. The weight Davic, with Serpents fat, and juice of Metals, given to one to drink, will make him mad, and make him run out of his House, Country and Nation: and this

this it doth by exaggeration of black Melancholy: or it will make people lunatick and melancholick if they do but hold it in their mouths: and by its drawing out of iron, Physicians think it will help well to draw an Arrow-head out of ones body.

But we use the Loadstone in making Glais. *Pliny*. After Glais was found out, as it is a very cunning invention, men were not content to mingle Nitre; but they began to add the Loadstone thereunto, because it is supposed, that it will attract the liquor of the Glais into it self, and into iron also. Hence it is, that in making Glais, we add a little piece of Loadstone to it, for that singular vertue is confirmed by our times, as well as former times: it is thought so to attract into it self the liquor of the Glais, as it draws iron to it; and being attracted, it purgeth it; and from green or yellowish Glais, it makes it white: but the fire afterwards consumes the Loadstone. Out of *Agricola*. We read also, That a Loadstone laid to ones head, will take away all the pains. *Galen* saith, It hath purging faculties; and therefore it is given to drink for the Dropsie: it will draw forth all the water in the Belly. Lastly, I shall not pass by the error of *Hadrian*, concerning the Loadstone: for he saith, That the iron by its weight makes the Loadstone never the heavier. For the Naturalists report, That if a great Loadstone were weighed in a Scale, and after that, should draw iron to it, it would be no heavier then it was when it was alone, though they be both together; so the weight of the iron is as it were consumed by the Loadstone, and hindered by it from any effect or motion: which I finde to be false. It is like that jear in *Aristophanes*, of a Clown that rid upon an Ass, and carried his Coulter at his back, that he might not load the Ass too much.



THE

THE EIGHTH BOOK OF Natural Magick: Of Physical Experiments.

THE PROEM.

I Intended to pass by these following Experiments in Physick, because I have everywhere mentioned them in my History of Plants; and we have not omitted anything, that was certain and secret in them that we knew, unless it be such things as could not be brought into that rank. And though other things shall be described in my Book of Distillations, yet that this place of Physick be not left empty, I changed my opinion, and have set down some of them here.

CHAP. I.

Of Medicines which cause sleep.



That we may in order set down those Experiments, of which we intend to speak, we will begin with those Diseases which happen in the Head; and first, with Sleep: for Soporiferous Receipts are very requisite to be placed amongst these Arcana, and are of very great esteem amongst Physicians, who by Sleep are wont to cheat their Patients of pain: and not of leis, amongst Captains and Generals, when they practice Stratagems upon their Enemies. Soporiferous Medicines do consist for the most part of cold and moist things. *Plutarch* in *Simpol.* saith, That Sleep is caused by cold; and therefore Dormitives have a cooling quality. We will teach, first, how

To cause Sleep with Mandrake.

Dioscorides saith, That men will presently fall asleep in the very same posture wherein they drink Mandrake, losing all their senses for three or four hours after; and that Physicians do use it, when they would burn or cut off a member. And skillful men affirm, That Mandrake growing by a Vine, will transmit its Soporiferous quality into it, so that those that who drink the Wine that is made thereof, shall more easily and readily fall asleep. Here we will relate the pleasant stories of the Mandrake out of Authors of Stratagems. *Junius Frontinus* reports, That *Hannibal* being sent by the Charchagenians, against some Rebels in Africa; and knowing they were a Nation greedy of Wine, mixed a great quantity of Mandrake with his Wines; the quality of which, is between poisonous and sleepy: then beginning a light Skirmish, he retired on purpose; and in the middle of the Night, counterfeited a flight, leaving some Baggage in his Camp, and all the infected Wine. Now when those Barbarians had took his Camp, and for joy, had liberally tasted of that treacherous Wine; he returned, took and slew them all, as they lay dead as it were before. *Pollinus* the same. And *Cesar* sailing towards Nicomedia, was taken about Malea by some Cilician Pirates: and when they demanded a great Ransome for his Liberty, he promised them double what they asked. They arrived at Miletum: the people

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came out of the Town to see them. *Cæsar* sent his Servant, being a Milesian, named *Epicrates*, to those of the Town; desiring them to lend him some money; which they presently lent to him: *Epicrates*, according to *Cæsar's* command, brought the money; and with it, a sumptuous Banquet, a Water-pot full of Swords, and Wine mixed with Mandrake. *Cæsar* paid to the Pirates the promised sum, and set the Banquet before them; who, being exalted with their great Riches, fell freely to it; and drinking the infected Wine, fell into a sleep: *Cæsar* commanded them to be killed sleeping, and presently repaid the Milesians their own money. *Demosthenes*, intending to express those who are bitten as it were by a sleepy Dragon, and are slothful, and so deprived of sense that they cannot be awakened; saith: They seem like men who have drunk Mandrake. *Pliny* affirmeth, That smelling to the Leaves of it, provoketh sleep.

For the same, with Nightshade.

We may make the same of Nightshade, which is also called, Hypnoticon, from the effect of it: a Drachm of the Rinde, drank in Wine, causeth sleep, but gently and kindly. This later Age, seemeth to have lost the knowledge of Solanum Maricon: for in the very description of it, *Discorides* seems to be mad. But in my judgement, (as I have elsewhere said) he describes two several Plants in that place: *Fuschus* his Stramonium, and the Herb commonly called Bella Donna, whose qualities are wonderfully dormitive: for they infect Water, without giving it either taste or sent: so that the deceit cannot be discovered, especially, considering it must be given but in a very small quantity. I prepared a Water of it, and gave it to a Friend for certain uses; who, instead of a Drachm, drank an Ounce; and thereupon lay four days without meat or motion; so that he was thought dead by all; neither could he be awakened by any means, till at last, when the vapours were digested, he arose: although *Discorides* threatneth nothing but death from the immoderate use of it. The same may be made also

Of Poppy

In a Lohoch. Take the Heads of Poppy, and cut them cross-ways, with a tender hand, lest the knife enter too deep: let your nail direct the issuing juice into a Glas; where let it stand a while, and it will congeal. The Thebane Poppy is best. You may do the same with Nightshade, Henbane. Of all these together, you may make

A Sleeping Apple.

For it is made of Opium, Mandrake, juice of Hemlock, the Seeds of Henbane; and adding a little Musk, to gain an easier reception of the Smeller: these being made up into a ball, as big as a mans hand can hold, and often smelt to, gently close the eyes, and binde them with a deep sleep. Now shall be shewn

A wonderful way to make one take a sleeping Medicine in his sleep.

Those things which we have already spoken of, are easily discovered after sleep, and bring a suspicion along with them. But out of many of the aforementioned dormitive menstres, there may be extracted a Quintessence, which must be kept in Leaden Vessels, very closely stop'd, that it may not have the least vent, lest it should fly out. When you would use it, uncover it, and hold it to a sleeping man's Nostrils, whose breath will suck up this subtil essence, which will so besiege the Cattle of his senses, that he will be overwhelmed with a most profound sleep, not to be shook off without much labour. After sleep, no heaviness will remain in his Head, nor any suspicion of Art. These things are manifest to a wise Physician; to a wicked One, obscure.

CHAP.

CHAP. II.

To make a Man out of his senses for a day.

After these Medicines to cause sleep, we will speak of those which make men mad: the business is almost the same: for the same Plants that induce sleep, if they be taken in a larger proportion, do cause madness. But we will not tell those things which breed it for ever, onely which may make us sport for a day, and afterwards leave no harm. We will begin with,

How to make men mad with Mandrake.

We have told you, That a small dose brings sleep; a little more, madness; a larger, death. *Discorides* saith, That a Drachm of Motion will make one foolish: we will easilier do it with Wine, which is thus made: Take the Roots of Mandrake, and but put them into new Wine, boyling and bubbling up: cover it close; and let them infuse in a warm place for two months. When you would use it, give it to somebody to drink; and whosoever shall taste it after a deep sleep, will be distracted, and for a day shall rave: but after some sleep, will return to his senses again, without any harm: and it is very pleasant to behold. Pray make trial. We may do the same

With Stramonium, or Solanum Maricum:

The Seeds of which, being dried and macerated in Wine, the space of a night, and a Drachm of it drank in a Glas of Wine, (but rightly given, lest it hurt the man) after a few hours will make one mad, and present strange visions, both pleasant and horrible; and of all other sorts: as the power of the potion, so doth the madness also cease, after some sleep, without any harm, as we said, if it were rightly administered. We may also infect any kinde of meat with it, by strowing thereon: three fingers full of the Root reduced into powder, it causeth a pleasant kinde of madness for a day; but the poisonous quality is allayed by sleep, or by washing the Temples and Pulses with Vinegar, or juice of Lemmon. We may also do the same with another kinde of Solanum, called

Bella Donna.

A Drachm of the Root of which, amongst other properties, hath this; that it will make men mad without any hurt: so that it is a most pleasant spectacle to behold such mad whimsies and visions; which also is cured by sleep: but sometimes they refuse to eat. Nevertheless, we give this precaution, That all those Roots or Seeds which cause the Takers of them to see delightful visions, if their Dose be increased, will continue this alienation of minde for three days: but if it be quadrupled, it brings death. Wherefore we must proceed cautiously with them. I had a Friend, who, as oft as he pleased, knew how

To make a man believe he was changed

into a Bird or Beast; and cause madness at his pleasure. For by drinking a certain Potion, the man would seem sometimes to be changed into a Fish; and flinging out his arms, would swim on the Ground: sometimes he would seem to skip up, and then to dive down again. Another would believe himself turned into a Goose, and would eat Grass, and bear the Ground with his Teeth, like a Goose: now and then sing, and endeavour to clap his Wings. And this he did with the aforementioned Plants: neither did he exclude Henbane from among his Ingredients; extracting the essences by their Menstruum, and mixed some of their Brain, Heart, Limbs, and other parts with them. I remember when I was a young man, I tried these things on my Chamber-Fellows: and their madness still fixed upon something they had eaten, and their fancy worked according to the quality of their meat. One, who had fed lustily upon Beef, saw nothing but the formes of Bulls in his imagination,

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and them running at him with their horns; and such-like things. Another man also by drinking a Potion, hung himself upon the earth, and like one ready to be drowned, struck forth his legs and arms, endeavouring as it were to swim for life: but when the strength of the Medicament began to decay, like a Shipwrack'd person, who had escap'd out of the Sea, he wrung his Hair and his Clothes to strain the Water out of them; and drew his breath, as though he took such pains to escape the danger. These, and many other most pleasant things, the curious Enquirer may finde out: it is enough for me only to have hinted at the manner of doing them.

CHAP. III.

To cause several kinds of dreams.

NOW we will endeavour to shew how to cause pleasant, sad, or true dreams. But that we may more certainly effect it, it will be good first to know the causes. The meat in concoction must be corrupted, (this must be taken for granted) and turned into vapors; which, being hot and light, will naturally ascend, and creep through the Veins into the Brain; which being always cold, condenseth them into moisture, as we see Clouds generated in the greater World: so by an inward reciprocation, they fall down again upon the Heart, the principal seat of the senses. In the meanwhile, the Head grows full and heavy, and is overwhelmed in a deep sleep. Whence it comes to pass, that the species descending, meet and mix with other vapors, which make them appear preposterous and monstrous: especially, in the quiet of the night. But in the morning, when the excrementitious and foul Blood is separated from the pure and good, and become cool and allayed; then pure, and unmixed, and pleasant visions appear. Wherefore I thought it not irrational, when a man is overwhelmed with drink, that vapors should arise participating, as well of the Nature of what he hath drank or eat, as of the humours which abound in his body, that in his sleep he should rejoyce or be much troubled: that fires and darknes, hail and putrefactions, should proceed from Choler, Melancholy, cold and putrid humors. So to dream of killing any one, or being befouled with Blood, shews an abundance of Blood: and Hippocrates and Galen say, We may judge a man to be of a sanguine Complexion by it. Hence those who eat windy meats, by reason thereof, have rough and monstrous dreams: meats of thin and small vapours, exhilarate the minde with pleasant phantasms. So also the outward application of simples, doth infect the species while they are a going to the Heart. For the Arteries of the body, saith Galen, while they are dilated, do attract into themselves any thing that is next them. It will much help too, to annoynt the Liver: for the Blood passeth upward out of the Stomack by evaporation, and runneth to the Liver; from the Liver to the Heart. Thus the circulating vapors are infected, and represent species of the same colour. That we may not please the Sleepers onely, but also the Waking, behold

A way to cause merry dreams.

When you go to bed, to eat Balm, and you cannot desire more pleasant sights then will appear to you; Fields, Gardens, Trees, Flowers, Meadows, and all the Ground of a pleasant Green, and covered with shady Bowers: wherefoever you cast your eyes, the whole World will appear pleasant and Green. Bugloss will do the same, and Bows of Poplar; so also Oyl of Poplar. But

To make dark and troublesome dreams,

we eat Beans; and therefore they are abhorred by the Pythagoreans, because they cause such dreams. Phaseoli, or French Beans, cause the same: Lentiles, Onions, Garlick, Leeks, VVeedbine, Dorycnium, Picnocomum, new red VVine; these infect dreams, wherein the phantasms are broken, crooked, angry, troubled: the person dreaming will seem to be carried in the Air, and to see the Rivers and Sea under him: he shall dream of misfortunes, falling, death, cruel tempests, showers

showers of Rain, and cloudy dayes; the Sun darkned, and the Heavens frowning, and nothing but fearful apparitions. So by annoynting the forehead places with Soot, or any adust matter, and Oyl, (which I add onely to make the other enter the easier into the parts) fires, lightnings, flashings, and all things will appear in darkness. These are sufficient: for I have already shewed in my Book *Phytognom.* how to procure true dreams.

CHAP. IV.

Excellent Remedies for the Eyes.

HERETOFORE, being much troubled with sore Eyes, and become almost blinde; when I was given over by Physicians of best account, a certain Emphyrick undrook me; who, putting this VVater into my Eye, cured me the very same day: I might almost say, The same hour. By Gifts, Entreaties, Cunnings and Money, I gained the Secret, which I will not think much to let down, that every one may use it at their pleasure. It is good for Inflammations, Bearems, Mists, Fittula's, and such-like; and cureth them certainly the second day; if not the first. If I should let down all those whom I have cured by it, I should be too tedious. Take two Bottles of Greek-VVine, half a Pint of White Rose-water; of Celendine, two Ounces; of Fennel, Rue, Eye-bright, as much; of Turry, half an Ounce; of Cloves as much: Sugar-Candy of Roles, one Drachm; Camphire, half a Drachm; and as much Aloes. Turry is prepared after this manner: Let it be heat and extinguished six times in Rose-water, mixed with Greek Wine; but let the water at last be left out: powder what are to be powdered finely; and mix them with the waters. Aloes is incorporated with waters thus: because it will not be powered, let it be put into a Mortar with a little of the forementioned waters, and beat together until it turn to water, and swim about in ropings, and mix with the waters: then put it to the rest. Set them all in a Glass-bottle, close covered, and waxed up that it do not exhale abroad in the Sun and Dew for forty dayes, still shaking them four times in a day: at last, when it is well tunned, let it up and reserve it for your use. It must be applied thus

In Inflammations, Blood-spots and Fittula's;

let the Patient lie flat on his back; and when a drop of this water is put upon his Eye, let him open and shut his Eye-lids, that the water may run through all the cavities of his Eye. Do this twice or thrice in a day, and he shall be cured. But thus it must be used for

A Pearl in the Eye.

If the Pearl be above or beneath the Cornea, make a Powder of Sugar-Candy of Roles, burnt Allome, and the Bone of a Turtle-Fish, very finely beat and searched exactly; and when the Patient goeth to Bed, sprinkle a little of this Powder upon his eye, and by and by drop some of this water into it, and let him shut his Eyes and sleep: for he will quickly be cured.

CHAP. V.

To fasten the Teeth.

I COULD finde not any thing in all this Physical Tract of greater value then this Remedy for the Teeth: for the water gets in through the Gums, even to the very Nerves of the Teeth, and strenghtens and fasteneth them: yes, if they are eaten away, it filleth them with Flesh, and new cloaths them. Moreover, it maketh them clean, and white, and shining like Pearls. I know a man, who by this onely Receipt, gained great Riches. Take therefore three handfulls of Sage, Nettles,

congealed or fetled. But wherefore acide things should dissolve them, we may thus guess the Reason: An Egg laid in any Vinegar some time, will wax soft, and his shell will dissolve. Also Lead, which is the toughest and heaviest, if it be laid in a Vessel of Vinegar, and closed up, will dissolve, and become Ceruis. By the same means, Copper, which is of a more solid Nature, if it be ordered as the former, will melt, and become Verdegreese. Likewise Pearl, as hard as Flint, which neither iron or fire can dissolve of themselves, when they are heat by the fire, and then sprinkled with Vinegar, break and dissolve. Therefore, when we see these things done before our eyes, we may infer by the same Reasons, that the Stone may naturally be dissolved by acide things, through the sharpness of their juice. Thus far *Vernvius*. The place where the Vein is now to be found, is called commonly *Francolise*, about a mile from Theano, and runneth along the way towards Rome.

To strengthen the Stomach.

We will not omit a wonderful Oyl, which helpeth concoction, and taketh away the inclinations to vomit: it is thus made: Pour half a Pint of the best Oyl into a brais Pot, tinned within, and of a wide mouth: then take fifteen pound of Romance-Mint, and beat it in a Marble-Morter, with a VVooden-Pestle, until it come to the form of an Oynment; add as much more Mint and VVormwood, and put them into the Oyl: mingle them, and stir them well; but cover the Pot lest any dirt should fall in; and let them stand three dayes, and infuse: then set them on a gentle fire, and boyl them five hours for fifteen dayes together, until the Oyl have extracted all the vertue of the infused Herbs: then strain them through a Linen-cloth in a press, or with your hands, till the Oyl be run cleer out: then set them on a gentle fire, and put them into the strained Oyl; boyl it again, and strain it again: do the same the third time; and as often as you renew it, observe the same course: until the Oyl have contracted a green colour: but you must separate the juice from the Oyl very carefully; for if the least drop do remain in it, the Oyl will have but small operation, and the whole intent is lost. A certain sign of perfect decoction, and of the juice being consumed, will be, if a drop of it, being cast upon a plate of iron red-hot, do not hiss. At last, Take a pound of Cinnamon, half a pound of Nutmegs, as much Mastic and Spikeard, and a third part of Cloves: pound them severally; and being well seirced, put them into the Oyl, and mix them with a VVooden-stick. Then pour it all into an Earthen Vessel glazed within, with a long Neck, that it may easily be shut, and stop close; but let it be of so great a capacity, that the third part of it may remain empty. Let it stand fifteen days in the Sun, always moving, and shaking it three or four times in a day. So set it up for your use.

CHAP. VII.

That a Woman may conceive.

There are many Medicines to cause Conception spread abroad, because they are much desired by Great Persons. The Ancients did applaud Sage very much for this purpose: And in Coptus after great Plagues, the Egyptians that survived, forced the Women to drink the juice of it, to make them conceive, and bring forth often. Salt also helpeth Generation: for it doth not only heighten the Pleasures of *Venus*, but also causeth Fruitfulness. The Egyptians, when their Dogs are backward in Copulation, make them more eager by giving them Salt-meats. It is an Argument also of it, That Ships in the Sea, as *Plutarch* witnesseth, are always full of an innumerable company of Mice. And some affirm, That Female-Mice will conceive without a Male, onely by licking Salt. And Fish-wives are insatiably lecherous, and always full of Children. Hence the Poets feigned *Venus* to be born of Salt or the Sea. The Egyptian Priests (saith the same Author) did most Religiously abstain from Salt and Salt-meats, because they did excite to lust, and cause erection.

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A remedy to procure conception.

This I have tried and found the best; when a womans courses are just past, let her take a new-laid egge, boil it, and mix a grain of musk with it, and sup it up when she goes to bed. Next morning take some old beans, at least five years old, and boil them for a good space in a new pipkin, and let the woman when she ariseth out of her bed, receive the fume into her privities, as it were through a tunnel, for the space of an hour: then let her sup up two eggs, and go to bed again, and wipe off the moisture with warm clothes: then let her enjoy her husband, and rest a while; afterwards, take the whites of two eggs, and mix them with Bole-armenick and Sanguis-draconis, and dip some flax into it, and apply it to the reins; but because it will hardly stick on, swathe it on from falling: a while after, let her arise, and at night renew the plaister. But when she goeth to sleep, let her hold ginger in her mouth. This she must do nine days.

CHAP. VIII.

Remedies against the Pox.

Since this disease hath raged so cruelly amongst men, there have been invented a multitude of most excellent remedies to oppose it. And although many have set out several of them, yet I will be contented with this one only, which we may use, not onely in this disease, but almost in all other: and I have seen many experiences of it. It is easily made, and as easily taken. Take a pound of *Sariaperilla* beaten small, five ounces of the stalks and leaves of *Senz*, one handful of *Agrimony* and *Horse-tail*, a drachm of *Cinnamon*, and as much cloves, and one nutmeg: Pound them all, and put them into a vessel which containeth twenty gallons of *Greek wine*; let it stand a day, and then let the patient drink it at meals, and at his pleasure: for it purgeth away by degrees all maladies, beside the French-pox. If the patient groweth weak with purging, let him intermit some days. In the summer time leave out the cinnamon, and the nutmeg. I have used it against continual head-aches, deafness, hoarseness, and many other diseases.

A preservation against the Pox,

which a man may use after unclean women. Take a drachm of hartwort and gentian, two scruples of sanders and lignum-aloes; half a drachm of powder of coral, spodium, and harts horn burnt, a handful of sowthistle, scordium, betony, scabious, and tormentil; as much of roses, two pieces of Guaiacum, two scales of copper, a drachm and a half of Mercury precipitate; a pint of malmesey, a quart of the waters of sowthistle, and scabious: mix the wine and waters, and lay the Guaiacum in it a day, and then the rest; then boil them, till half be consumed; strain them, and lay a linnen-cloth soaking in the expression a whole night; then dry it in the shade: do this thrice, and after copulation, wash your yard in it, and lay some of the linnen on, and keep it close.

CHAP. IX.

Antidotes against Poyson.

It is the common opinion of all Physitians, that those herbs, stones, or any other thing, which being put into a Serpents mouth, doth kill him, is an Antidote against his poyson. We read in *Dioscorides* of the herb *Alkanet*, which is very efficacious against the poyson of Serpents; and being chewed and spit out upon a Serpent, killeth him. Upon this, I thrust half a drachm of treacle or mithridate, mixt with *Aqua vita*, into a vipers mouth, and she died within half an hour. I made a water-serpent swallow the same, but she received no hurt by it, onely lay a small time stupified: wherefore I pressed some oyl out of the seeds of citron, and orange or lemons;

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lemons, and drop it into the serpents mouth, and she died presently. Moreover, a drachm of the juice of Angelica-roots will kill a serpent. The Balsame, as they call it, which is brought from the west-Indies, is excellent against them; for when I anointed their mouth and jaws with it, they died in half an hour. Balsame of the east, is a present remedy against poyson by oynments, or the biting of a serpent, saith *Ælius*. In Arabia, where it groweth, there is no fear of poyson, neither doth any one dye of their bitings; for the fury of this deadly poyson, is allayed by the feeding of the serpents upon this pretious Balsame. But I have found nothing more excellent than the earth which is brought from the Isle of Malta: for the least dust of it put into their mouths, kills them presently. I have tried the same vertue in Lithoxylon, which Physitians use for the worms in children. There is a stone called Chelonites, the French name it Crapodina, which they report to be found in the head of a great old Toad; and if it can be gotten from him, while he is alive, it is sovereign against poyson: they say it is taken from living Toads, in a red cloth, in which colour they are much delighted; for whilst they sport and open themselves upon the scarlet, the stone droppeth out of their head, and falleth through a hole made in the middle, into a box set under for the purpose, else they will suck it up again. But I never met with a faithful person, who said that he found it: nor could I ever find one, though I have cut up many. Nevertheless, I will affirm this for truth, that those stones which are pretended to be taken out of Toads are minerals; for I remember at Rome I saw a broken piece of stone, which was compacted of many of those stones, some bigger, some less, which stuck on the back of it like limps on a rock. But the vertue is certain: if any swallow it down with poyson, it will preserve him from the malignity of it; for it runneth about with the poyson, and asswageth the power of it, that it becometh vain and of no force.

A most perfect oyl against poyson,

often tried in repressing the violence of it. Take three pound of old oyl, put into it two handfulls of the flower of St Johns wort, and let them macerate in it for two months in the sun. Then strain out the flowers, and put into the oyl two ounces of the flowers of the same herb, and set it to boil in Balneo Mariæ a quarter of a day. Stop the bottle close, that it may have no vent, and set it a sunning for fifteen days. In the month of July, take three ounces of the seed, stamp it gently, and steep it in two glasses of the best white-wine, with gentian, tormentil, white dittany, zedoary, and carline gathered in August, red sanders, long aristolochie, of each two drams: Let all these macerate in the wine for three days; then take them out, and put them in the oyl, and boil them gently in Balneo for six hours; then strain them in a press. Adde to the expression an ounce of saffron, myrrhe, aloes, spikenard, and rubarb, all bruised, and let them boil in it for a day in B. M. at last treacle and mithridate, of each two ounces, and let them also boil in it six hours as before: then set it forty days in the sun. It must be used thus: In the plague-time, or upon suspicion of poyson, anoint the stomach and wrists, and the place about the heart, and drink three drops of it in wine. It will work wonders.

CHAP. X.

Antidotes and preservatives against the Plague.

I have spoken of poysons, now I will of the plague, being of the same nature, and cured almost by the same Medicines. I will set down onely them, which in our time have been experimented by the Neapolitanes, Sicilians, and Venetians (whilst the plague was spread amongst them) to resist the contagion of that epidemical plague, and preserve their bodies from infection.

A confession of Gilliflowers against the plague, of wonderful operation.

Gather some clove-gilliflowers in the month of May, of a red and lively colour, because they are of the greater vertue; pull them out of their husks, and clip off the green

green end, then beat them in a marble mortar with a wooden pestle, until they become so fine as they may hardly be felt. In the mean while, take three pound of sugar for one of the flowers; melt it in a bras skillet, and boil it with a little orange-flower-water, that may quickly be consumed. When it is boiled sufficiently, put in some whites of egges beaten, enough to froth and clarify it, still stirring it, and skimming off the froth with a spoon, until all the dregs be taken out. Then put in the due weight of flowers, and stir it with a wooden slice, till it turn red: when it is almost boiled, adde thereunto two drachms of cloves beaten with a little musk, the mixture of which will both add & excite a sweet sent and pleasantness in the flowers. Then put it into earthen pots, and set it up: if you add a little juyce of lemon, it will make it of a more lively blood-colour. We may also make Lozenges and round Cakes of it, by pouring it on a cold marble. If any would do it after the best manner, they must extract the colour of the flowers, and boil their sugar in that infusion, for so it will smell sweeter. Some never bruise the flowers, but cut them very small with sizers, and candy them with sugar; but they are not very pleasant to ear. This confession is most grateful to the taste, and by reason of the sent of the cloves, very pleasant. The vertues of it are these, as I have found by experience: it is good for all diseases of the heart, as fainting, and trembling thereof; for the megrum and poyson, and the bitings of venomous creatures, and especially against the infection of the plague. There may be made a vinegar, or infusion of it, which being rub'd about the nostrils, is good against contagious air, and night-dews, and all effects of melancholy.

Against the Plague.

Gather Ivy-berries in May, and wilde Poppies before the sun rise, left they open; In April gather goats rue: dry them in the shade, and make them into powder. One drachm of it being drank in wine, is excellent against infectious diseases. The Bezoor stone, brought from the west-Indies, being hung about the neck nigh to the heart; or four grains of it in powder, being taken in wine, is good against the plague, and the infection of all pestilential feavours, as I can testify: And taketh away soundings, and exhilarateth the heart. The water or oyl, extracted from the seeds of Citron, is a very strong Antidote against the plague. *Apparitus Hispanus*, his oyl is also approved against the same.

CHAP. XI.

Remedies for wounds and blows.

There are some remedies for wounds and blows, which shall not be omitted, for I have found some of them to be of wonderful vertue.

The oyl of Hispanus for wounds and other things.

Take two pound of new wax, four ounces of wax, as many of linseed, two ounces of rosemary-flowers, and bay-berries, as many of betony; of chamomil-flowers, or the oyl of it, three ounces; of cinnamon an ounce and a half, as much of St Johns wort, or the oyl of it, two ounces of old oyl. Dry the flowers and herbs in the shade; and when they are withered, beat them, and seice them through a sieve. Melt the wax on the fire, then pour in the oyls, next the powders, still stirring them with a stick. At length, pour it on a marble, and cut it into small slices, and put it into a glass retort; stop it close with straw-mortar, and set it on the fire with his receiver; stop the joynts, and give the inclosed no vent, left the virtue flye out and vanish away. First, by a gentle fire draw out a water; then encreasing it, and changing the glass, draw a red oyl; stop them close, and keep them for use: the qualities of it are heating; by anointing the neck, it cureth all creeks that are bred by cold; it healeth wounds, helpeth the contraction of the nerves caused by cold; it mollifieth cold gouts, and taketh away the trembling of the hands; It may be drank for the Sciatica, taken in wine; it helpeth the quinsie: by anointing the reins of the

back, and the belly, or by drinking the water or oyl in wine, it will break the stone and bring it down, and aswageth poyson. For deafness, you must steep some wool in it, and stop the ears with it: anoint the belly and back in any pain there. Being drunk in vinegar, it cureth the falling sickness, and restoreth lost memory; it provoketh the menstrues in women, by anointing their privities with it, or by drinking some drops of it in wine; taken in the same manner, it provoketh appetite, being taken early in the morning; and is good against the bitings of Scorpions: Drink it going to bed, or when you arise in the morning, and it will cure a sinking breath.

For cold aches.

Oyl of Hens is excellent to allay and remove all cold aches, the gout, sciatica, griefs of the sinews, convulsions, pain in the joynts, cold distillations, and other diseases of moisture and cold. In the Diomedian Isles, now called Tremity, in the Adriatique Sea, there are birds, commonly called Hearn's, who breed there, and continue there, and are to be found nowhere else: they are a kind of Duck, feeding on fish, which they catch in the night: they are not to be eaten, though they be very fat, because they favour of the rankness of fish. Kill these birds, and pluck off their feathers; draw them, and hang them up by the feet, there will drop from them a certain black yellowish oyl, very offensive to the nose, being of a noisome fishy smell. This oyl being applied to any place, as much as you can endure, will do the effects before mentioned, and more: but it is very hurtful for any hot maladies. There is a water also

For old Sores.

Take lime unkill'd, and dissolve it in water; stir it three or four times in a day; then when it is settled and cleared, strain it and keep it; wet a linnen cloth in it, and apply it to a wound or sore, and it cureth them. I will not omit

The virtues of Tobacco.

Out of the seeds of it is expressed an oyl, three ounces out of a pound, which allays the cruel tortures of the gout: the juice clarified and boiled into a syrup, and taken in the morning, maketh the voyce tunable, clear and loud; very convenient for singing Masters. If you bruise the leaves, and extract the juice, it killeth lice in childrens heads, being rubbed thereon. The leaves cure rotten Sores and Ulcers, running on the legs, being applied unto them. The juice of this herb doth also presently take away and assuage the pain in the codd's, which happeneth to them who swimming do chance to touch their codd's.

CHAP. XII.

Of a secret Medicine for wounds.

Here are certain Potions called Vulnerary Potions, because, being drunk, they cure wounds: and it seemeth an admirable thing, how those Potions should penetrate to the wounds. These are

Vulnerary Potions.

Take Pirole, Comfrey, Aristolochy, Featherfew of each a handful; of Agrimony two: boil them in the best new Wine: digest them in horse-dung. Or take two handfuls of Pirole, of Sanicle, and Sowe-bread one, of Ladies Mantel half one. Boil them in two measures of Wine, and drink it morning and evening. Binde the herbs, which you have boiled, upon the wound, having mixt a little salt with them: and in the mean while use no other Medicine.

The Weapon-Salve

Given heretofore to Maximilian the Emperor, by Paracelsus, experimented by him, and always very much accounted of by him while he lived: It was given to me by a noble

noble man of his Court. If the Weapon that wounded him, or any stick dipt in his blood be brought, it will cure the wound, though the Patient be never so far off. Take of the mois growing upon a dead man his scull, which hath laid unburied, two ounces, as much of the fat of a man, half an ounce of Mummy, and man his blood: of linseed oyl, turpentine, and bole-armenick, an ounce; bray them all together in a mortar, and keep them in a long streight glass. Dip the Weapon into the oylment, and so leave it: Let the Patient in the morning, wash the wound with his own water; and without adding any thing else, eye it up close, and he shall be cured without any pain.

CHAP. XIII.

How to counterfeite infirmities.

It hath been no small advantage to some, to have counterfeited sicknesses, that they might escape the hands of their enemies, or redeem themselves for a small ransom, or avoid tortures; invented by former ages, and used by these latter. I will first teach you

How to counterfeite a bloody Flux.

Amphiretus Acantius, being taken by Pirates, and carried to Lemnos, was kept in chains, in hope that his ransom would bring them a great sum of money. He abstained from meat, and drank Minium mixt with salt water. Therefore, when he went to stool, the Pirates thought he was fallen into a bloody Flux, and took off his irons, lest he should dye, and with him their hopes of his ransom. He being loose, escaped in the night, got into a Fisher-boat, and arrived safe at Acantium: so saith *Polianus*. Indian Figs, which stain the hands like ripe Mulberries, if they be eaten, cause the urine to be like blood: which hath put many into a fright, fearing they should dye presently. The fruit of the Mulberry, or Hogges blood boiled and eaten, maketh the excrements seem bloody. Red Madder maketh the urine red, saith *Dioscorides*. We may read also, that if you hold it long in your hand, it will colour your urine. I will teach you also

To make any one look pale.

Cumme taken in drink causeth paleness: so it is reported, That the Followers of *Porcius Larro*, that famous Master of Rhetorick, endeavored to imitate that colour which he had contracted by study. And *Julius Vindex*, that assertor of liberty from *Nero*, made this the onely bawd to procure him an executorship. They smoke themselves with Cumme, who disfigure their faces, to counterfeite holiness and mortification of their body. There is an experiment also, whereby any one may know how

To cause Sores to arise.

Take Perwinckle, an herb of an intolerable sharpness, that is worthily named *Flammula*; bruise it, and make it into a plaister, and it will in a short space ulcerate, and make blisters arise. Cantharides beaten with strong water, do also raise watry blisters, and cause ruptures.

CHAP. XIV.

Of Fascination, and Preservatives against enchantments.

Now I will discourse of enchantment; neither will I pass over in silence, who they are whom we call Enchanters: For if we please to look over the Monuments of Antiquity, we shall finde a great many things of that kind delivered down to posterity. And the tryal of later ages doth not altogether explode the fame of them: neither do I think that it derogate from the truth of the stories, that we cannot draw the true causes of the things, into the streight bonds of our reasons, because there are many things that altogether impede the enquiry: but what I myself judge of others opinions, I thought fit here to explicate. You may find many things in *Theocritus* and *Virgil*, of this kind: whence that verse arose: *There's*

*There's some, I know not whose unlucky eye
Bewitcheth my yong Lambs, and makes them die.*

Isgonus and *Memphadorus* say, There are some families in *Africa*, that bewitch with their tongue the very Woods: which if they do but admire somewhat earnestly, or if they praise fair trees, growing corn, lusty children, good horses, or fat sheep, they presently wither, and die of a suddain, from no other cause or harm: which thing also *Solinus* affirmeth. The same *Isgonus* saith, there are amongst the *Friballians* and *Illyrians*, certain men, who have two pupils in each eye, and do bewitch most deadly with them, and kill whatever they look earnestly on, especially with angry eyes; so pernicious are they: and yong children are most subject to their mischief. There are such women in *Scythia*, called *Bithia*, saith *Apollonides*. *Philarchus* reporteth of another kind, called *Thibians* in *Pontus*, who had two pupils in one eye, and in the other the picture of a horse; of which *Didymus* also maketh mention. *Damon* relateth of a poyson in *Ethiopia*, whose sweat would bring a consumption in all bodies it touched: and it is manifest, that all women which have two pupils in one eye, can bewitch with it. *Cicero* writeth of them; so *Plutarch* and *Philarchus* mention the *Paetheobri*, a Nation inhabiting in part of the *Pontick Sea*, where are *Inchanters* who are hurtful, not onely to children that are tender and weak, but to men of full growth, who are of a strong and firm body; and that they kill with their looks, making the persons languish and consume away as in a consumption. Neither do they infect those onely who live among them, but strangers, and those who have the least commerce with them; so great is the power and witchcraft of their eyes: for though the mischief be often caught in copulation with them, yet it is the eyes that work; for they send forth spirits, which are presently conveyed to the heart of the bewitched, and so infect him. Thus it cometh to pass, That a yong man, being full of thin, clear, hot, and sweet blood, sendeth forth spirits of the same nature; for they are made of the purest blood, by the heat of the heart: and being light, get into the uppermost parts of the body, and flye out by the eyes, and wound those who are most porous, which are fair persons, and the most soft bodies. With the spirits there is sent one also a certain fiery quality, as red and beare-eyes do, who make those that look on them, fall into the same disease: I suffered by such an accident my self: for the eye infecteth the air; which being infected, infecteth another: carrying along with it self the vapors of the corrupted blood, by the contagion of which, the eyes of the beholders are overcast with the like redness. So the Wolf maketh a man dumb; so the Cockatrice killeth, who poysoneth with looking on, and giveth venomous wounds with the beams of his eyes: which being reflexed upon himself, by a looking-glass, kill the Author of them. So a bright Mirror dreadeth the eyes of an unclean woman, saith *Aristotle*, and groweth cloudy and dull, when she looketh on it: by reason that the sanguine vapour is contracted by the smoothness of the glass into one place; so that it is spotted with a kind of little mist, which is plainly seen; and if it be newly gathered there, will be hardly wiped off. Which thing never happeneth on a cloth or stone, because it penetrateth and sinketh into the one, and is dispersed by the inequality of parts in the other. But a Mirror being hard and smooth, collecteth them entire; and being cold, condenseth them into a dew. In like manner almost, if you breath upon a clear glass, it will wax moist as it were with a sprinkling of spittle, which condensing will drop down: so this efflux of beams out of the eyes, being the conveyers of spirits, strike through the eyes of those they meet, and flye to the heart, their proper region, from whence they rise; and there being condensed into blood, infect all his inward parts. This stranger blood, being quite repugnant to the nature of the man, infects the rest of him, and maketh him sick: and there this contagion will continue, as long as he hath any warm blood in his body. For being a dissembler in the blood, it will cast him into a continual fever; whereas, if it had been a dissembler of choler or flegme, it would have afflicted him by intervals. But that all things may be more distinctly explained, you must know first, that there are two kind of Fascinations mentioned by Authors: One of Love, the other of Envy or Malice.

Malice. If a person be enlured with the desire of a fair and beautiful woman; although he be caught at a distance, yet he taketh the poyson in at his eyes, and the Image of her beauty setteth in the heart of this Lover, kindleth a flame there, which will never cease to torment him: For the soft blood of the beloved, being thrayed thither, maketh continual representations of her: she is present there in her own blood; but it cannot settle or rest there, for it continually endeavoureth to flye homeward, as the blood of a wounded person spirits out on him that giveth the blow. *Lucretius* describeth this excellently:

*He seeks that body, whence his grief he found;
For humors always flow unto a wound.
As bruised blood still runs unto the part
That's struck, and gathers where it feels the smart:
So when the murderess of his heart's in place,
Blasphes arise, and red ore spreads his face.*

But if it be a Fascination of Envy or Malice, that hath infected any person, it is very dangerous, and is found most often in old women. Neither can any one deny, but that the diseases of the minde do distemper the body; and that the good disposition of it, doth strengthen and corroborate the same: and it doth not work this alteration onely in its own body, but on others also, by how much it stirreth up in the heart inward desires of love and revenge. Doth not coverousness, grief, or love, change the colour and disposition? Doth not envy cause paleness and meagreness in the body? Doth not the longing of the mother, imprint the mark of what she desired upon the tender Embryo? So when Envy bends her fierce and flaming eyes, and the desire of mischief bursts thereout, a vehement heat proceedeth from them, which infecteth those that stand nigh, especially the beautiful; they strike them through as with a word, set their entrails on fire, and make them wait into a leanness, especially if they be of a cholerick or sanguine complexion; for the disease is easily fed, where the pores are open, and the humors thin. Nor is it the passions of the mind onely, that affecteth the body thus: but the body itself, as *Avicenna* proveth, may be endued with venomous qualities: many are so by Nature; so that it cannot seem a wonder, if sometimes some are made so by Art. The Queen of India sent to *Alexander* a very beautiful maid, anointed and fed with the poyson of Serpents, as *Aristotle* saith, and *Avicenna* from the Testimony of *Rufus*. *Galen* writeth of another, who eat Henbane without any harm; and another, Woolf-bane; so that a Hen would not come near her. And *Attribidates* (as old Histories deliver it to us) King of *Pontus*, had so strengthened himself against poyson, that when he would have poysoned himself, lest he should fall into the hands of the Romans, nothing would do him any hurt. If you give a Hawk a Hen fed with snakes or lizards flesh, or which barely boiled in the broth of them, it will make him mew his feathers betimes: and many other such things are done, which are too long to be recounted. So many men are of such a nature, that they will cure some diseases onely with their stroaking. Many eat Spiders and wilde Olives, and care not for the biting of Serpents, nor suffer any wasting or consumption, if they be of such a nature, that their looks or breath will not onely blast men, but plants and herbs, and any other thing, and make them wither away: and oftentimes, where such kind of creatures are, you may find blasted corn, poysoned and withered, merely by the contagion of their eyes, the breath that cometh from them. Do not women in the time of their courses, infect cucumbers and melons, by touching or looking on them; so that they wither? Are not children handled with less prejudice by men then women? And you will find more women then men witches, by reason of their complexion; for they are farther distant from a right temper, and eat more unwholesome food; so that every moneth they are filled with superfluities, and purge forth melancholy blood: from whence vapors arise, and flye out through their eyes, poysoning those that stand nigh them, and filling them with the same kind of blood. Hence sanguine complexioned men, and somewhat cholerick, who have large, shining, gray eyes, and live chafly (for too often copulation exhausteth the moisture) who by frequent

frequent glances, and continual imagination, encounter point to point, beams to beams, eyes to eyes, do generally stir up love. But why a man is taken by this Fascination with one, and not another, appeareth by the former, and this reason: for it happeneth from the intention of the Inchanter, who by those spirits or vapors, is transmitted into the bewitched person; and he receiving them, is made like unto him: For the infection seizing on his mind, and fixing in his imagination, becomes a permanent habit, and maketh the spirits and blood obedient to it; and so bindeth the imagination, and inflameth them with the thing beloved. Although the mind (which opinion is fathered upon *Avicen*, neither doth it want his authority) can of its own will and power, produce such passions. *Musau* will have the eyes to lay the foundation of Love, and to be the chief allurements of it. And *Diogenianus* saith, That Love is begotten by looks, affirming that it is impossible for a man to fall in love unawares. So *Juvenal* placeth that Lover among prodigies,

Who burnt with Love of her he never saw :

For the bright glances of the eyes, driveth the Object into a kind of madness, and reach the rudiments of Love. The other parts are scarce any cause of Love, but provoke and entice the beholder to stay, and gaze a while upon their beauty, whilst the eyes wound him; for there they say, *Cupid* lieth in ambush with his bowe, ready to shoot his arrows into the beholders eyes, and set his heart on fire. For thy eyes slide in through my eyes (saith *Apuleius*) and raise a cruel fire within my heart. Now I have discovered the original of it unto you; unless you are quite mad, you may many ways forisfie your self against it. But many one may well wonder, considering those diseases which come by infection, as the itch, scabbiness, blear-eyes, the plague, do infect by sight, touching or speaking, and presently cause putrefaction, why Love's contagion, which is the greatest plague of all, doth not presently seize upon men, and quite consume them: Neither doth it infect others onely, but sometimes it returneth upon it self, and the persons will be ensnared in their own charms: It is reported by the Ancients of *Emelides*, that he bewitched himself by reflection in water, looking-glasses, or fountains, which returned his own shadow upon him. So that he seemed to be beautiful unto himself, that falling in love with that wherewith he used to entrap others, he lost his former complexion, and died a Sacrifice unto his own Beauty. So children oftentimes effascinate themselves, when their parents attribute it to haggards and witches. Now take

Some Preservatives against Love.

There are many prescribed by wise antiquity. If you would endeavor to remove the charms of love, thus you may expel them. Turn your face away, that she may not often her eyes on yours, nor couple rays with you; for you must remove the cause from the place, where it useth to make its impression: forsake her company, avoid idleness, employ your mind in business of concernment; evacuate blood, sweat, and other excrements in a large quantity, that the infection may also be voided with them.

A Preservative against Envy.

If it be the witchcraft of Envy, you may know it thus. The infected loseth his colour, hardly openeth his eyes, always hangerh his head down, sighs often, his heart is ready to break, and sheddeth salt and bitter tears, without any occasion or sign of evil. To disencharm him, because the air is corrupted and infected, burn sweet perfume to purifie the air again, and sprinkle him with waters sweetened with cinnamon, cloves, cypress, lignum aloes, musk, and amber. Therefore the old custome is continued until this day, and observed by our women, to smoke their children, and rowl them about in frankincense. Keep him in an open air, and hang Carbuncles, Jacinthies, or Sapphires about his neck. *Diocorides* accounteth Christs Thorn, wilde Hemp, and Valerian, hung up in the house, an amulet against witchcraft. Smell to Hyssope, and the sweet Lilly; wear a ring made of the hoof of a tame or wilde Ass; also Satyrion, the male and female, are thought the like. *Aristotle* commendeth Rue, being smelt to. All these do share the power of witchcraft.

THE

THE
NINTH BOOK
OF
Natural Magick:

How to adorn Women, and make them Beautiful.

THE PROEME.

Since next to the Art of Physick, follows the Art of Adorning our selves, we shall set down the Art of Painting; and how to beautifie Women from Head to Foot, in many Experiments: yet lest any man should think it superfluous to interpose those things that belong to the Ornaments of Women, I would have them consider, that I did not write these things for to give occasion to augment Luxury, and for to make people voluptuous. But when God, the Author of all things, would have the Natures of all things to continue, he created Male and Female, that by fruitful Procreation, they might never want Children: and to make Man in love with his Wife, he made her soft, delicate and fair, to entice man to embrace her. We therefore, that Women might be pleasing to their Husbands, and that their Husbands might not be offended at their deformities, and turn into other womens chambers, have taught Women, how, by the Art of Decking themselves and Painting, if they be ashamed of their foul and swart Complexions, they may make themselves Fair and Beautiful. Some things that seemed best to me in the Writings of the Ancients, I have tried, and set down here: but those that are the best, which I and others have of late invented, and were never before in Print, I shall set down last. And first I shall begin with the Hairs.

CHAP. I.

How the Hair may be dyed Yellow, or Gold-colour.



Since it is the singular care of Women to adorn their Hair, and next their Faces; First, I will shew you to adorn the Hair, and next the Countenance. For Women hold the Hair to be the greatest Ornament of the Body; that if that be taken away, all the Beauty is gone: and they think it the more beautiful, the more yellow, shining and radiant it is. We shall consider what things are fit for that purpose; what are the most yellow things, and will not hurt the Head, as there are many that will: but we shall chuse such things as will do it good. But before you dye them,

Preparing of the Hair

must be used, to make them fit to receive a tincture. Add to the Lees of White-wine as much Honey that they may be soft, and like some thin matter: smear your Hair with this, let it be wet all night: then bruise the Roots of Celandine, and of the greater Clivers Madder, of each a like quality: mingle them, being bruised, very well with Oyl, wherein Cummin-Seed, Shavings of Box, and a little Saffron, are mingled; anoynt your Head; and let it abide so twenty four hours: then wash it with Lye made of Cabbage-Stalks, Alhes, and Barley-Straw: but Rye-Straw is the best: for this, as Women have often proved, will make the Hair a bright yellow. But you shall make

K k

A Lye to dye the Hair

thus: Put Barley-Straw into an Earthen-pot with a great mouth, Feny-Grac, and wilde Cummin; mingle between them, Quick-lime and Tobacco, made into Powder: then put them upon the Straw beforementioned, and pour on the Powders again; I mean by course, one under, the other over, till the whole Vessel be full: and when they are thrust close, pour on cold water, and let them so stand a whole day: then open a hole at the bottom, and let the Lye run forth, and with Sope use it for your Hair. I shall teach you

Another.

To five Glasses of Fountain-water, add Alum-Feces, one Ounce; Sope, three Ounces; Barley-Straw, one Handful: let them boyl in Earthen-pots, till two thirds be boyled away: then let it settle: strain the Water with the Ashes; adding to every Glas of Water, pure Honey one Ounce. Set it up for your use. You shall prepare for your Hair

An Oynment

thus: Burn the Feces of Wine, heaped up in a Pit, as the manner is so that the fire may go round the Pit: when it is burnt, pown it, and seice it: mingle it well with Oyl: let the Woman anoynt her Head with it when she goes to Bed; and in the morning, let her wash it off with a Lye, wherein the most bitter Lupines were boyled. Other Women endeavour

To make their Hair yellow

thus: They put into a common Lye, the Pills of Citrons, Oranges, Quinces, Barley-Straw, dried Lupines, Feny-Grac, Broom-Flowers, and Tartar coloured, a good quantity: and they let them there lie and steep, to wash their Hair with. Others mingle two parts Sope, to one part Honey; adding Ox-Gall one half part: to which they mingle a twelfth part of Garden-Cummin, and wilde Saffron: and setting them in the Sun for six weeks, they stir it daily with a wooden-staff: and this they use. Also of Vinegar and Gold Liharse, there is made a decoction very good to dye the Hair yellow as Gold. Some there are, that draw out a strong VVater with fire, out of Salt-Peter, Vitriol, Salt-Ammoniac, and Cinaber; where-with the Hairs dyed, will be presently yellow: but this is wont to burn the Hair: those that know how to mingle it, will have good effects of it. But these are but ordinary; the most famous way is

To make the Hairs yellow:

draw Oyl from Honey by the Art of Distillation, as we shall shew: First, there will come forth a clear VVater, then a Saffron-colour, then a Gold-colour: use this to anoynt the Hair with a Sponge; but let it touch the Skin: for it will dye it Saffron-colour, and it is not easily washed off. This is the principal above others, because the Tincture will last many dayes: and it will dye Gray-Hairs, which few others will. Or make a Lye of Oak-Ashes, put in the quantity of a Bean of Rheubarb, as much Tobacco, a handful of Barley-Straw and Feny-Grac, Shells of Oranges, the Rasplings of Guaiacum, a good deal of wilde Saffron and Liquorish: put all these in an Earthen-pot, and boyl them, till the water sink three fingers: the Hairs will be washed excellently with this. Hold them in the Sun, then cast Brimstone on the Coals, and fume the Hairs; and whilst it burns, receive the smoke with a little Tunnel at the bottom, and cover your Head all over with a cloth, that the smoke file not away.

CHAP.

CHAP. II.

How to dye the Hair Red.

BECAUSE there are many men and women that are tuddy Complexions, and have the Hair of their Heads and Beards Red; which, should they make yellow-coloured, they would not agree with their Complexions: To help those also, I send you these Remedies: The Ancients used the decoction of the Lote-Tree raine, which we call Melo Fiocco: and so they made their Hair Red. Or else, by burning the Feces of the old Wine, as I said, they added Oyl of Mastick thereto, which they provided thus to the purpose. They heaped up the ripe Berries of the Mastick-Tree for some dayes, till they might wither: then they poured on water, and boyled them so long in Brazen Kettles until they brake: they put them in Bags, and pressed out the Oyl with a press. With this Oynment, they kept their Head anoynted all the night, and so made them Red. But how we may

Dye the Hair Red

I shall teach you. There is a Powder brought to us from Africa, they commonly call Alchena: if we boyl it in a Lye till it be coloured, and anoynt our Hair with it, it will dye them red for many days, that is indeible: but whilst you handle it, take heed you wet not your Nails therewith: for they will be so died, you cannot easily make them clean. So also we dye the Tails and Mains of white Horses red. But I can easily do it with Oyl of Honey; for when the clear and Saffron-coloured waters are drawn off, increase the fire, and the Oyl will come forth, the red. This is excellent to make the Hairs red, and it will dye white Hairs red for many dayes; and when that tincture is worn off, the Hairs will shine of a golden colour. But when we anoynt our Heads with a Lye, we take a wet sponge with nippers, that we may not stain our Hands or skin of our Heads.

*With Herbs a woman dy'd her hoary Head:
And Colours better'd Nature, as 'tis said.*

CHAP. III.

How the Hairs are dyed Black.

IT is worth the while, to shew such as are ashamed to seem old, how to dye their hoary Hairs black, as if they might grow young again by it. And if we provide for young women, we must do as much for aged Matrons; especially, if it fall out that they grow hoary too soon. Of old, they made a decoction of Sage-Leaves, the green Husks of Walnuts, Sumacts, Myrtle-berries, Black-berries, Cypress-nuts, Rindes of the Roots of Halm-Tree, and such-like: for the Rinde of the Root of Halm-Tree, boyled till it be soft, and consumed, and then smeared on all night, blacks the Hair, first made clean with Fullers Earth. Learn therefore

How Gray Hairs are dyed Black.

Anoynt your Hair in the Sun with Leeches that have lain to corrupt in the blackest Wine sixty daies, and they will become very black. Or else, Let a sextary of Leeches stand in two sextaries of Vinegar in a Leadn Vessel to corrupt for sixty daies; and as I said, anoynt your Hair. *Pliny* saith, It will dye so strongly, that unless they hold Oyl in their mouths, when they dye the Hair, it will make their Teeth black also. But if you would have

Long and Black Hair;

Take a green Lizard, and cutting off the Head and Tail, boyl it in common Oyl, and anoynt your Head with it. You shall have also

Another.

Yet you may thus dye your Hair and Beard handsomely, if they be grown Gray: Froth of Silver, burnt Brasse, must be mingled with four times the quantity of strong Lye: and when it bubbles on an easie fire, wash your Hair with it; and when they are dry, wash them with hot water. I used this as the Ancients taught it: and I made a Lye of Quick-Lime and Oak-Ashes, that they commonly call the Capitel; in that I boyled Licharge of Silver: then I tried it on white Wool; for if it be dyed black, as I would have it, then I took it from the fire; or else, I boyled it longer. If it burnt the Wool, I put water to it; or else, dyed with it. Add Lycharge. Wash your Hair or Beard with this, and it will dye them with a shining black colour, and it will not be discerned: for the more you wash it, the better it will shine.

CHAP. IV.

To make Hairs part smooth.

Because sometimes a part is deformed with abundance of Hair, or for lack of Hair, I shall shew how to make a smooth part thick with Hair, and a hairy part smooth, by depilatories.

A common Depilatory,

which men use commonly in Baths. It consists of Quick-Lime, four parts made into Powder, Orpiment one part: boyl them. Try with a Hens Feather; when that is made bare with it, it is boyld: take heed you boyl it not too much, or that it stay not too long upon your skin, for it will burn: but if it chance to burn your skin, take Populeum and Oyl of Roses or Violets, and anoynt the place, and the pain will be gone. This must be done in a Bath; but if you cannot have one, let the Woman be covered with cloths very well, and let it be cast on burning Stones or Tiles, that she may receive the fume of it, and sweat. After she hath sweat, let her wash her self with her water, and wipe it off: then let her anoynt her self all over; for the parts anoynted thus, will presently grow smooth. And thus may all parts be kept free from Hair. The Ancients used these, as *Salserna*, as *Varro* reports, teacheth in his Book of Husbandry. If (saith he) you would make any one smooth from Hair, cast a pale Frog into water, and boyl it to a third part; and with that anoynt the Body. But by pale Frog we must understand a Toad: for a Frog hath no such faculty. A Salamander soaked in Oyl, will pull out the Hair. *Dioscorides*. But it will be stronger, if you steep it long in Oyl, and dissolve it. The filthy matter that is white as Milk, and is vomited up at the mouth by the Salamander, if it touch any part of the Body, all the Hair will fall off. *Dioscorides* saith, That the Sea-Scolopendra boyled in Oyl, and smeared on the part, will pluck off the Hair by the Roots. But

To make Hair grow slowly,

If you press Oyl out of Henbane-Seed with a Press, or do often anoynt the places with the juice of it, they will grow again very slowly. The same is done with the juice of Hemlock. Or to take off the Hairs, men added to Ants Eggs, red Orpiment, and Ivy-Gum, with Vinegar; and they rubbed the place where the Hair was taken away. In former times, they rubbed the down-parts of children with the Roots of Hyacinthus; and the Hair would never grow there. And therefore it is well known in trimming Medicaments sold here and there, that being smeared on with sweet Wine, keeps back the Beard, and will not let it break forth. But if you would

That Hair should never grow again,

In which business I have taken great pains, and tried many things that I found to be false; First, foment the part with hot water, and pull out the Hairs one by one with

with womens nippers: then dissolve Salt-Peter in water, and anoynt the holes where the Hairs grew. It will be better done with Oyl of Brimstone, or of Vitriol: and so they will never grow again; or if they do, after one year, they will be very soft: do then the same again, and the parts will be bare always. So I have made womens Fore-heads longer, and have taken off Hair from parts hotter than the rest.

CHAP. V.

How Hair may grow again.

But for those that would have Hair grow where it should, these Remedies will do it: sometimes womens temples use to be deformed for want of Hair. I shall teach you how

Hair falling off before old age, may be held fast.

And if any Hair hath fallen off, to make it grow again, torrifie Gith upon the Coals; when it is torrified, powder it, sift it, and mingle it with water; and anoynt your Head. The Ancients made their Hair grow again with these Remedies: with the Ashes of a Land Hedge-hog, or of burnt Bees or Flies, or the Powder of them dried; also with Man's Dung burnt, and anoynted on with Honey, to which they added well the Ashes of Small-nuts, Wall-nuts, Chest-nuts, and other Bean-like substances: for by all these mingled together, or by them single, Hair will be made to grow. But if you will

That Hair shall grow quickly,

I know that by often washing the place with that water that first distils from Honey by the fire, much Hair will soon grow; or if you do but moisten the place with wet cloths, and not wipe it, but let it always continue wet. Also Noble Mastrons may use this

To make the Hairs grow softer.

Augustus was wont to burn his Legs with a burning Nar, that the Hair might grow softer. But

That Hair may grow longer and quickly,

Bruise Marsh-Mallow-Roots with Hogs-grease, and let them boyl long in Wine: then add Cummin-Seed well bruised, Maltick, and yolks of Eggs well boyled: first, mingle them a little, and then boyl them: strain all through a Linen-cloth, and let it stand and settle; then take the fat that swims on the top, and anoynt the Head, first washed. But to make them grow quickly, take Barley-Bread with Salt and Beers Grease: burn the Bread; and with such a mixture anoynt the place. Some beleeve a glazed Pint with the fat of a Horles Neck, and they boyl a River-Eel that is fat, and cut into pieces in it, till it dissolve into Oyl, and they anoynt the part with it.

CHAP. VI.

To take away Sores and Worms that spoil the Hair.

There is a certain plague of the Hair that befalls them, and breaks, cuts, and takes the Hair quite off from the Head. I will add the Remedies presently, whereby to take them away. It is healthful, in these Diseases, to apply bitter things to kill the Worms, called Tiners or Syrens: take the Flowers of Myrtle-Trees, Broom-clary: boyl them in Vinegar, till the Vinegar be consumed, and then rub the ends of the Hair continually with it. Also grinde bitter Lupines into fine Meal; boyl them in Vinegar, and then rub the Hairs between your hands: for this will kill these Sirens, and drive them away. But I used very hot Bread, newly taken forth of the Oven, cut in the middle, and putting the Hair between them till they grow cold.

Chap.

CHAP. VII.

How to make Hair Curl.

Curl'd Hair seems to be no small Grace and Ornament to the Head: and women that use painting do all they can to curl the Hair. If you will know how

To Curl the Hair,

Boyl Maidenhair with Smallage-Seed in Wine, adding a good quantity of Oyl: for this will make the Hair curl'd and thick. *Pliny*. Moreover, if you put the Roots of Daffidils into Wine, and pour this often on the Head, being shaved, it will make the Hair curl the more, as the same Author saith: or else, bruise the Root of Dwarf-elder, with Oyl, and anoynt the Head therewith, and binde the Leaves of the same upon the Head. Some say that Camels Dung will curl the Hair: or else, poun the Ashes of a Rams Horn, with Oyl; and with that anoynt the Head often, being first shaved. So also, will the Ashes of Chest-nuts or Hedge-hogs do, if you with Honey smear the Head with it.

CHAP. VIII.

Remedies to make the Eye-brows black.

Before we leave off to speak of Hair, I shall shew how to make the Eye-brows black, because women are as desirous of this as of the rest. The Greeks call them Calliblephara, that is, Fair Eye-brows: wherefore the Ancients used

To dye the Eye-brows

with black Earth like Bitume or Sea-Cole: being burnt, it is a very fine black: and it is added to those Remedies that serve to dye the Eye-brows and the Hair black: or else the Marrow of an Ox-bone taken out of the Right-Leg before, and beaten with Soor, is good to dye the Hair, and faulty Eye-brows, and the corners of the Eyes. Also, Soot is tempered for this purpose, with the smoak of Paper, and Oyl of Sefama, the smoot being wiped off of a new Vessel with a Feather. The Kernels of Dates burnt in a new earthen Pot, and the Ashes washed, serve instead of Spodium; and they are mingled with Eye-salves, and they make Calliblephara; adding Spikenard thereunto. And if they be not well burnt, burn them again. Also Roie-Leaves are fit to burn for the same use. Also, you may amend your Eye brows thus; Take Labdanum, and beat it with Wine, and mingle Oyl of Myrtles with it, and make a very thick Oynment: or infuse in Oyl the black Leaves of the Myrtle-Tree, with a double quantity of Galls bruised, and use that. Use this. Galls are fried in Oyl, and they are ground with a little Salt-Ammoniac; and then mingled with Vinegar, wherein the Pills of the Mulberry and Bramble have been boyled: with these anoynt the Eyebrows, and let it abide on all night; then wash it off with water. But if you would

Change the colour of childrens Eyes,

you shall do it thus: anoynt the fore part of their Heads with the Ashes of the shells of Hazel-nuts and Oyl, it will make the white eyes of children black, if you do it twice. There are many Experiments to make white and gray Eyes black, and to alter the colours. But I shall let them pass, because those that want them will not so lightly endanger their Eyes; nor do they answer the expectation, as some have tried them.

CHAP.

CHAP. IX.

How to make the Face white.

I taught formerly in my Book of Plants, That with white cleer Silver-coloured Herbs, Shell-Fish, and Stones, the Face might be made white, polished and Silver-coloured. I shall now set down some examples, by which you may invent many more. I shall first speak of Simples, then of Compounds: Simples that are white, make the face white. The Lilly is a complete white colour: the bulbous tops of it, like Onyons boyled in water, or the distilled water of them, will make the Faces of Maides white, if they wash them therewith, morning and evening. With-wind bears a Flower like to the Lilly: without any smell; but within like Saffron: it is only white, and is as it were the Rudiments of Nature, when she goes about to form a Lilly. The distilled water from the flowers will wonderfully make the Face whole. Also with the decoction of Ivory, one may make the Face like Ivory. Melanthium makes the Face beautiful. *Discorides*. But it shews its excellency when it is thus prepared: Powd it, and sift out the finest of it, take the juice of Lemmons, and let the Meal of Gih lie wet in it twenty four hours; take it out, and let it dry: then break an Egg with the Shell, and mingle it with it: then dry it in the shade, and sift it once more. In the morning, when the woman riseth out of her bed, let her put this into a white Linen-clout, that is not too fine, and wet it with water or spiritale; and let her rub her Face with the clout, that the moisture alone, and not the Meal, may come on the Face. If you will have

Your Face white,

it may be made as white as Milk many ways, and chiefly with these that follow: Let Litharge of Silver, half an ounce, boyl in a Glazed Earthen Pot, with strong Vinegar, until the thinner part be evaporated: set it up for use. Then, in another Pot, let half a pound of clear water boyl: then mingle both these waters together, and shake them; and it will become like Milk, and sink to the bottom: when it is settled, pour it off; water being plentifully poured in: and leaving it a while to settle, pour it off again, and pour on fresh; shake it, and leave it to settle a short time, and so forbear. That which is settled, set in the Sun: and when it is grown stiff, as thick pap, make small balls of it, and lay them up. You may use these with water to make the Face white. Or else powder Lytharge of Silver, eight ounces, very fine: pour on the Powder, of the strongest Vinegar five pints: distill them, and keep them for your use. Then take Allome de Plume, Salt Gemma, one drachm; Frankincense, one ounce and a half; Camphire, two drachms; Oyl of Tartar, six ounces; Rose-water, one pound: powder what must be powdered, and pour it in: distill the water in Chemical Vessels, and set it up. When you would use them, mingle a little of both waters in the palm of your hand, and it will be like Milk: rub your Face with it, and it will be white. Or else take off the Pills of about twenty Citron Lemmons; infuse the Pills in one pound of the best Wine, and one pint and an half of Rose-water, for six days: then add one ounce of white Lilly and Mallow-Roots, and let them stay as many days: then add Rosin of Turpentine, four ounces; white Mercury sublimate, two ounces; Boxen, half an ounce; ten whites of Eggs made hard at the fire: and mingle all these together: let them stay one night. The next day, put a cap upon the Vessel, and luting the joyns well, that nothing may breath forth, let the water drop into a Vessel to receive it: set it aside for use. I use this, that is easie to make, and doth the business completely: Take the white of an Egg, and stir it so long with an Iron, that it froth well: let it stand to turn to water: then take half an ounce of the best Honey, and beat with that water, and mingle them until they unite: add to them the quantity of two Corns of Wheat, of Mercury sublimate, finely powdered: when you go to bed, take some of the water in the palm of your hand, and wash your Face; and so let it dry in, that it may not stick to the Linen: in the morning, wash it off with Fountain-water, and you shall find your Face cleer and white.

Chap.

CHAP. X.

How women shall make their Faces very clean to receive the Colour.

BEfore any thing be used to make the Face beautiful, it must be made very clean and fit to receive it: for oft-times women have excellent Waters and Remedies brought them, but they have no operation: wherefore the matter is, that they must first prepare their Face. This is the best

Preparation of the Face.

Bind Barley-Meal-Bran in a Linnen-cloth, and let it down into a Pot full of water, and let it boyl till a third part be remaining, and press out the juice: with this decoction wash your face, and let it dry: then bruise Myrrh, and mingle it with the white of an Egg, and burn it on hot Fire-sticks, or red hot Tiles, and receive the fume by a tunnel: let the narrow part of it be toward the Face, and the broad to the fire: cover the head with a Napkin, that the smoak flie not away; and when you have received sufficient of the smoak, rub your Face with a Linnen-cloth: then use your Remedy to annoynt your Face. I shall shew you

One that is stronger.

When the skin must be cleansed or made white, you must cleanse some parts of your Face from skins that will not let your painting Oyntments stick. Powder an ounce of sublimate very finely: put it into a Pot that is glazed, and cast into it six whites of Eggs, so beaten, that they are turned into water: then boyl them on hot Embers, till they grow thick: put them into a Linnen-cloth that is loosely weaved, and press the water out of them with your hands, and wash your Face with it: then mingle Honey, whites of Eggs, and the aforesaid water together, equal parts: put some in your palm, and rub the place you would make white, with the palms of your hands: then boyl spelt; and when it is boyled, take the fume of it by a tunnel: then rub your Face with a course Linnen-cloth. Others wash their Face with water, wherein fine flour is boyled.

CHAP. XI.

How the Face may be made very soft.

THe next Beauty of the Face and Hands, is Tenderness, which is procured by far things; and chiefly by Milk; and principally of Asses: for it takes off wrinkles, and makes the skin white and soft. And therefore, it was not for nothing, that *Poppa Sabina*, Nero's wife, had always five hundred Asses with her: and in a Bath with a fear, she soaked all her body with that Milk. Wherefore if you would have

Your Face made soft and white.

Steep crumbs of Bread in Whey or in Milk; then press it out, and with that water wash your Face; for it will wonderfully whiten your Face, and make the skin fair. Or, take six Glasses of Milk, steep crumbs of Bread in it five hours: take ten Lemmons, make clean the Pills, and cut the Body of them into thin slices: then shake ten whites of Eggs; bruise an ounce of Camphire, Allom Saubarinum, two ounces; mingle them all, and distill them, and set it in a glazed Vessel close covered, in the Sun; and then set it up for your use. Here is one stronger

For the same purpose.

Boyl two Calfs Feet in water; first make them clean: then boyl the water till half be consumed; put it in Rice one pound, and boyl it well: let crumbs of Bread steep in Asses Milk or Goats Milk, with ten whites of Eggs bruised with their Shells: distill all at a gentle fire; add to the water a little Camphire and Borax: put into a glazed vessel, two yong naked Pigeons, with their guts taken forth, and put in as much Milk as will cover them; and add one ounce of Borax; Turpentine, three ounces; Camphire, one ounce; five whites of Eggs: put on the cover, and distill them; for it is far things that make the Face soft. I shall say more, when I come to speak of making the hands white and soft: the reason is the same for both.

Chap.

CHAP. XII.

How to make the face clear and shining like silver.

THe face is not onely made clear, but white as silver, by those things that I said were white as silver; yet not exactly as silver, but they shine as clear as silver. There is an herb commonly called *Argentaria*, or *Argentina*, or wilde Tanley, whose leaves are green above, but on the backside they shine of a silver colour: the distilled water of it is drunk by women against spots in their faces, and to make them white as silver. The snails that are found in moist places, and leave behind them, as they creep, a silver cord (*Discofoides* saith, will cure the spots in the face) women much desire them: for they put them in a still and draw out water from them, that polisheth the skin exceedingly, and makes it contract a silver glais. And the sea-shell-fish, like an ear, whose shell is of a silver colour within, or pearl colour, and many kinds of shells; that being steeped in vinegar, will grow pure, casting off the outward crust; as the Oyster-shell doth that brings forth pearl. There are also shells, we call the Mothers of pearl, that inwardly are shining, and of a silver colour, like pearls: all which women use for their art of beautifying themselves: for they make the face smooth, and to shine as white as silver. But pearls do it best of all things, when they are dissolved in sharp juices, and soaked in rotten dung, till they send forth a clear oyl, that is the best thing to beautify the face, as I shall shew elsewhere. For the same use, is a glais-stone used, that shines like silver. But no better water is prepared, then from Talk, or Quick-silver, as I shall shew in that which follows.

CHAP. XIII.

How to dissolve Talk for to beautify women.

THough I shall speak in a work, on purpose, more at large, how Talk may be dissolved into water or oyl. We shall here onely set down, how it may be fitted for womens use. Of all such ways as are used, I shall set forth such as I have tried to be good. Beat Talk in a mortar of meral; then put it into a pot of the strongest clay, and cover it, and bind it in with strong iron wyer; lute it well all over, and keep the joints that nothing breathe out; and set it in the Sun to dry. Then put this stone in an oven, that flames strongly, or in some other place, where the fire is most vehement. When the fire of the oven is out, take it forth and break the vessel; and if it be well calcined, it is enough: Otherwise do the same again, until the calx of it be as white as it ought to be. When the calcined body of it, is white, as it must be, grind it on a porphyry-stone, and put it into a little bag, or upon a marble in a very moist place, or deep well, or cistern; and let it lie there long, and with much moisture it will drop forth at last: It will more easily and perfectly dissolve into water, if it were burnt long enough, and turned into a calx. For the parts being turned to lime, and made exceeding dry by force of fire, they attract moisture. It is also done

Another way

that is good. Calcine the Talk, and put it in an earthen pot, and set it in the hottest part of a potters oven, to stay there six days. When the Talk is thus turned to a calx, put it into a gourd-glass, which you shall first make clean, and make a hole at the bottom of it: and setting a vessel under it, you shall have the moisture of it drop forth, and the calx will resolve into water: put this into a glass viol, and let the water evaporate in Baines: take the sediment out for your use. I use also

Another way:

Put snails in an earthen vessel, in the open air, that they may be kept hungry three days, and pine for want of meat, and be purged; then take a silver Load-one, of Talk, most finely powdered, mingle it with the white of an egge, and make an ointment; annoynt the earthen vessel with it, and put the snails into it, for they will eat up all the Talk: When they have eaten all, and voided their excrements; bruise

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the snails with their shells; and putting them into a retort, draw out their moisture with a gentle fire; the humour that drops forth, will exceedingly adorn the face.

C H A P. XIV.

The preparation of Sublimate.

I Said, that there was nothing better than quick-silver for womens paints, and to cleanse their faces, and make them shine. Wherefore, I shall set down many ways to Prepare it, that you may have the use of it to your desire. Take one ounce and half Of pure quick-silver, not falsified with lead: for if there be lead mingled with it, all Your labour is lost. How it must be purged and known, I taught elsewhere. Mingle this with half a pound of Mercury sublimate, and put it into a marble mortar, and with a new wooden pestle, stir it well, turning it round about. First, it will be black, in six hours it will grow white, if you cease not to beat it. Then add one ounce and half of white salt, always turning it about with the pestle; for the more you grind it, the perfecter it will be. When it is very well ground, it must be washed. Sprinkle boiling clear water into the mortar, and stir it, and then stay a while, until the muddy part may sink down, and the filth that was lighter, and swims on the top: laying the vessel on one side, pour out the water gently, and pour in fresh; do this five or six times in the same manner, until the pure and onely powder remain without dregs: make little cakes of it, and dry it in the sun. Some whilst they bruise it, sprinkle water on, lest the powder by grinding should be made so small, that it should fly away into the air. The chief business is to purge it, and grind it well, that it be not troubled when it is strain'd forth: that which is gone to the bottom, and so part of it be lost; some open a hole in the belly of a pot, that when it is settled, the hole being opened, the water with the dregs may run forth. Others to sublimate, adde a third part of quick-silver, and grind it in a wooden mortar; and in the mean while they chew four grains of mastick in their mouths, and they spit the clammy spittle out of their mouths into the mortar, until it be white, as I said: then they boil it in one pound of the distilled water, of Bryony-root, till it be consumed: then they put a linnen cloth, to receive it at the mouth of the vessel, and so they strain it forth, and set it in the sun: they make troches of it with Gum Traganth; others to sublimate, add a sixth part of quick-silver, bruising it round about: then they adde camphir, borax, and cerus, half as much, and mingle all together. The principal matter is, it is the best way to sprinkle it with water whilst you grind it, lest by grinding it, the powder become so light, that it fly away: also, when the water is poured on, all the filth will come on the top, and more easily be poured off: then when the sublimate is washed, it is left to settle down: then again pouring off the former water, they pour on fresh, and they wash it oft, till they see it is enough, and no black swims on the top. But there is no better, as we said, than

Water of quick-silver.

But some will not away with quick-silver, by reason of the hurt it commonly doth to the teeth: but they use other water. Yet there is no better water, then that which is extracted from quick-silver; it is so clear and transparent, and the face anointed with it, shines like silver: it draws the skin handsome, and makes it soft by and by; and I never saw a better: the manner was shewed before.

C H A P. XV.

How white-lead is prepared for the face.

BECAUSE sublimate is so dangerous, there is a private way to do it with cerus, but not the usual way, that women may have their desire, without hurting their skin or their teeth. I am now come to the business of cerus. Take of swines grease well

well washed and cleaned in common water, at least ten times: put it into a lye of sweet water, and after fifteen days, into a pot, or earthen vessel, with a broad mouth, pouring in the sharpest vinegar, put in your swines grease, that the vinegar may swim three fingers above it: then fasten a plate of lead on the mouth of the pot, well luting the joynts with linnen cloths, that the vinegar may not evaporate. Every fifteen days take off the cover, and see how it is, if the lead be dissolved, and scrape the cover of all that hangs upon it, and put in the cover, anoint it all about, and let it stand so long, till all the rest be performed, as I said before, and the whole lead be turned to cerus. Cerus must be washed thus: Pour water into a vessel, put the cerus into it; stir it up and down, that what dregs there is may swim on the top: the cerus is heavy, and will sink to the bottom: Pour forth what swims above in the vessel, and pour on fresh water; and do this so often, until the pure cerus be found without dregs: dry it, and lay it up.

Another way,

Take two handfuls of cleaned barley, let it steep all night in fair water; then dry it on a linnen cloth, spread abroad in the sun. When it is dried, pound it in a marble mortar; when it is bruised, put it into a glazed vessel, which is full of vinegar, and cast upon this four whole eggs, with their shells: then stop the vessel with a plate of lead, that is arched, or not very even, and let there be no place that gives vent. Set it half in the sand, and let it stand in the open sun; after ten days, take off the covering of the vessel, that you stop it with; strike down the cerus that is in it with a feather, and scrape it off: then take the eggs out, and put in new, and do as you did; and after so many days scrape it off, until the whole plate be consumed. Let down the cerus you have stricken off, into a vessel full of water, bound up in a linnen cloth that is clean, and moderately fine, and stir it in the water, carrying it about here and there, until the muddy part of it run forth, and the sediment remain in the cloth: let the water settle, and strain it, and pour it forth, changing the water so long, until no dregs remain. Lastly, strain forth the water, and lay up the powder when it is dry. This alone with fountain water, will make the face white, mingled with the white of an egge, and will make it shine. Some

Another way

wash cerus, and make it pure. Mingle hard of hemp, with whites of eggs well stir'd: role up the cerus in the middle of it: and wrapping a cloth about it, boil it one hour in a new earthen pot, putting water to it: as it boils, take off the skum: then take it from the fire; and if any Lead be sunk down, cast it forth: afterwards make Troches of it with Gum-Traganth, that it may keep the better. Some bid boyl in water of white Lillies, Cerus very finely powdered, tied up in a skin, and fastned in a Linnen-cloth over it to the handle of the Vessel. The manner of boyling is the same as I first shewed. Then pour it forth into an earthen dish, and strain it gently from all its moisture: dry it fifteen days in the Sun, and keep it.

C H A P. XVI.

The best Sopes for women.

I Shewed in particulars how you might procure whiteness, lustre, and softness to the Face: now shall I speak of waters made of these, that will at the same time make, if it be first rub'd clean,

The Face white, clear, ruddy and soft.

These I speak of can do it, being composed together, and distilled. Take Cerus ready washed, one ounce; half as much Mercury sublimate; Gum-Traganth as much; Tartar, one ounce: powder all these, and put them into a young Pigeon washed and unbowelled, and sew them in: put it into a new Earthen Pot full of water, distilled by a Retort: boyl it till the filth part from the bones; then distill it: when

you go to bed, wash you Face; and in the morning wash it with Fountain-water: so you shall have it white, clear, soft, and well-coloured. Also you may do it

Another way.

Bruse three pound of Bean-Cods, the shells; add two pounds of Honey, and one of Rosin of Turpentine: put them into a Vessel, and close it that nothing vent forth; and let it ferment eight days in dung: then add four pound of Asies milk: and in the Vessel draw forth Oyl at the fire; use this water morning and evening. If you will have

Another way,

do it thus. Distil all these severally; Elder-flowers, and Flowers of wilde Roses, Broom, Honey-suckles, *Solomons-seal*, and Briony-Roots, sowre Graces, and Sarcocolla: mingle equal parts of each, or distil them again, and let them in the Sun. This will be the best. I shall shew

Another for the same.

Pull off a Hens Feathers without water, take out her Entrails, cut her in pieces, let infuse one night in white-Wine: in the morning wash her in it, and press her between your hands that no Wine remain; and then adding two Cups of white-Wine, distil her in a Chymical Vessel: then distil the Flowers of Bindeweed, Citrons, Oranges together; and keep this water by it self. Then open Lemmons, and press out the juice. And, also take water of Bean-flowers; then distil six cups of Asies milk, and as many of Cows-milk. You shall do the same with water of Gourds, and of Milk well boyled, and of water of Bean-flowers, and of Rosin of Turpentine. Then provide a glazed Vessel, put into it, Camphire two drachms, four ounces of Ceruis finely powdered: mingle them with the aforesaid waters, and let it in a soft Vessel in the open Air fifteen days and nights. When you would use it, wet a Linnen-rag in it, and wash your Face.

CHAP. XVII.

How to make the Face Rose-coloured.

I Have made the Face white, now I will make it red, that the wife may be made wholly Beautiful for her husband. And first,

To make a pale Face purple-coloured.

And to adorn one that wants colour, use this Remedy. Take Vinegar twice distilled, and cast into it the rasplings of red Sanders, as much as you please: boyl it at a gentle fire, adding a little Allom, and you shall have a red colour most perfect to dye the Face. If you would have it sweet-smelling, add a little Musk, Civer, Cloves, or any Spices. Now

Another,

Take Flowers of Clove-Gilliflowers, bruse the ends of the sprigs, and draw forth the juice; if they be so ripe that they are black, add juice of Lemmons, that they may shine with a more clear red. With this paint your Face, and you shall have a pleasant red colour without any stinking smell; or wet the sprigs of Clove-gilliflowers in juice of Lemmons, and set them in the Sun. Take away the old, and put in fresh, until it be as red as you would have it: let the juice dry, and the color will be most glorious. But I draw a quintessence from Clove-gilliflowers, Roses, Flower-gentle, with Spirit of Wine; then I add Allom, and the juice of a Citron, and I made an excellent colour to beautifie the Face. Take

Another.

If you add to the best Wine one tenth part of Honey, and one ounce of Frankincense; and

and then distil it, and steep in it the rasplings of red Saunders until it is coloured to your minde; and then wash your Face with it: it will make your Face white and well-coloured. Also,

A Fumus that cannot be detected:

And it is so cunningly made, that it will delude all men; for a clear water makes the Cheeks purple-coloured, and it will last long; and the clearer the part will be, the more your wash it with it, and rub it with a cloth of Woolen. You shall draw out a water from the Seeds of Cardamom, (which the Apothecaries call Grains of Paradise) Cubebs, Indian Cloves, rasplings of Brasil and Spirit of Wine distilled: when they have been infused some time, draw forth the water with a gentle fire, or corrupt Dung, and wet your Face often with this. There are also Experiments

To colour the Body.

If you boyl Nettles in water, and wash your Body with it, it will make it red-colored, if you continue it long. If you distil Straw-berries, and wash your self with the water, you shall make your Face red as a Rose. But the Ancients dyed their bodies of divers colours; partly, for ornament; partly, for terror: as *Casus* writes of the Britans going to war; for they painted themselves with wood. *Theophrastus* calls it *statis*, and we call it *Guado*. The Grecian-women painted themselves with wood, as *Zenophon* writes. And in our days the West-Indians crush out in Harvest-time a blood-red juice from the Roots of wilde Buglofs: which the women know well enough, whereby they cover their pale colour with a pleasant red: and so change their over-white colour with this Experiment.

CHAP. XVIII.

To wash away the over-much redness of the Face.

I Have shewed you how to colour the Face, now I shall shew how to uncolour it: when the Face is too red, and women that are very red desire this. The way is:

To wash away the too-much redness of the Face,

Take four ounces of Peach-Kernels, and Gourd-Seed two ounces; pown them, and crush them out strongly, that you may draw forth an oily Liquor: with this, morning and evening, anoynt the red Carbuncles of your face, and by degrees they will vanish and be gone.

Another.

Take Purple-Violets, Egg-shells, Saunders Camphire mingled with water: set the water in the open Air, and wash the redness therewith. Also, I know that the distilled water of white Lillies will take away the redness.

CHAP. XIX.

How to make a Sun-burnt Face white.

When women travel in the open Air, and take journeys in Summer, the Sun in one day will burn them so black, that it is hard to take it off. I found out this

Experiment.

Beat about ten whites of Eggs till they come to water: put them in a glazed Vessel, adding one ounce of Sugar-Candy to them: and when you go to bed, anoynt your Face, and in the morning wash it off with Fountain water. *Pliny* also saith thus.

Also

Another.

If the Face be smeered with the white of an Egg, it will not be Sun-burnt. With us, women that have to do in the Sun, to defend their Faces from the heat of it, that they may not be black, they defend it with the white of an Egg beaten with a little Starch, and mingled; and when the Voyage is done, they wash off this covering with Barley-water. Some do it

Another way:

rubbing their fowl Skin with Melon-Rindes; and so they easily rub off Sun-burnings, and all other spots outwardly on the Skin. The Seed also bruised and rubbed on, will do it better. Also, a Liquor found in little bladders of the Elm-Tree, when the Buds first come forth, makes the Face clear and shining, and takes away Sun-burnings.

CHAP. XX.

How Spots may be taken from the Face.

Oft-times fair women are disgraced by spots in their Faces; but the Remedy for it, is this: to use Abstersgents and Detergents in whitening of their Faces. Therefore,

To take off spots from the Face,

anoynt the Face with Oyl of Tarrar, and let it dry on, and wash it not at all: do this for ten days: then wash it with a Lixivium, and you shall see the spots no more. If the part be not yet clean enough, do it once more. If this please you not, take

Another.

Put Quick-Lime into hot water; mingle them, and stir them for ten days. After two days, pour forth the clear water into a Brazen Vessel: then take Salt-Ammoniac between your Finger-tops, and rub it so long at the bottom of the Vessel, until you see the water become of a blew-colour; and the more you rub it, the better colour it will have, and it will turn into a Skie-colour or Purple-colour, very pleasant to behold. Wet Linen-cloths in this water, and lay them on the spots, till they be dry, and wet them again, till the spots be gone. See

Another.

Take two ounces of Turpentine Rosin, Cerufs as much; mingle them with the white of an Egg; and stirring them well, besmeer Linen-cloths with them. And when you go to bed, let them stick to the spots: in the morning wash the place; and do the same again, till all the spots be gone. If you please, here is

Another.

The distilled water of Pimpernel, mingled with Camphire and laid to the Face, will make women that desire to be beautiful have a clear Skin, very lightly to behold; and will take off the spots. Distil the Mulberry-Leaves; let the water stand ten dayes in the Sun: add to this, Mercury sublimare, Verdigrease, artificial Chryocolia, called Borax, and a good quantity of the Powder of Sea-Cockle-shells finely beaten. Set it for many dayes in the Sun, and then use it. If you will

rub off the wan colour of your cheeks,

do thus; especially, for women when they are in their courses: Anoynt the place with Cerufs, and Bean-flower mingled with Vinegar; or yolks of Eggs, mingled with Honey. The same may be done with Bean-meal and Feny-Greek, smeered on with Honey. But we wipe away

Black and blew marks

thus;

thus: If you wash the black and blew places with the juice of the Leaves and Roots of Thapsia made into Cakes in the Sun, but one night, they will be taken away. Nero Cesar made his Face white from the strokes he had received in his Night-walks, with Wax and Frankincense; and the next day his Face was clear against all reports. Or Oyl pressed from the Seeds of Flowers, when it is thick, will do it rarely. Or the Root mingled with equal quantities of Frankincense and Wax, (but let it stay on but two hours at most) then foment the place with Sea-water hot. Alio, Wal-nuts bruised or smeered on, will take away black and blew spots. Vinegar or Honey anoynted will take away the same. So doth Garlick rubbed on: and brings black and blew to the right colour. Or the Athes of it burnt, smeered on with Honey. The juice of Mustard-Seed, anoynted on but one night, is good for the same: or it is anoynted on with Honey, or Suet, or a Cerate. If a Briony-root be made hollow, and Oyl put into it, and it be boyled in hot Embers; if that be anoynted on, it will blot out black and blew spots. Marks that are noted upon Children by Women great with-child, when they long exceedingly, are taken away thus: Let her first eat of that Fleth or Fruit her belly full: then let her binde on that Fleth alive, or the green Fruit to the part, till it die or corrupt; and they will be gone. Or else, let her wash the place with *Aqua Fortis*, or *Regia*, and the Skin grows very black: so it will take the marks away. Do it again

For spots and beauty.

I will not omit *Alian's* Experiment of a Lion, which is a kinde of Locust. For in some Membranes, where the Testes are bound together, under which there are some soft Carbuncles, and tender, that are called the Lions fat; This will help people to make ill Faces look comely, mingled with Oyl of Roses; and made into an Oyntment, it will make the Face look fair and shining.

CHAP. XXI.

How we may take off red Pimples.

Because red Pimples use to deform the Face; and specially, the whitest: therefore, to take them off, use these Remedies. I often, to take off

Pimples,

used Oyl of Paper; namely, extracting it from burnt Paper. I shall shew the way elsewhere, because I will not disturb the Order: where I shall speak of the Extraction of Oyls and Waters. Wherefore anoynting that on the red spots, will soon blot them out.

For the same.

Rear Eggs are good, twenty of them boyled hard cut in the middle, and the yelks taken forth: fill up the hollow places in the whites, with Oyl of sweet Almonds and Turpentine-Rosin: extract the Liquor in a Glass Vessel: use it.

Another.

Beat two Eggs well together, add as much juice of Lemmons, and as much Mercury sublimare: set it in the Sun, and use it.

Another to polsh the Face.

Take Sow-bread-Roots, three parts; cleaned Barley, six parts; Tartar calcined, one part; Roots of wilde Cucumers powdered, two parts; Wheat-Bran, two handfuls: let them all boyl in Water, till a third part be consumed: then wash your Face with it.

CHAP. XXII.

How Tetters may be taken from the Face, or any other part of the Body,

Ring-worms will so deform the Face, that nothing can do it more: sometimes, they run upon other parts of the Body, as the Arm-pits and Thighs: there drops forth of them, a stinking water that will foul the cloths. I found these Remedies

Against Tetters.

Distill water from the Roots of Sowredock, and add to every pound of these, of Pumpions and Salt-Peter, half an ounce; Tartar of white-Wine, two ounces: let them soak for some days: then distill them, and wash your Face in the morning therewith; and at night, smear it with Oyl of Tartar and of Almonds, mingled. Oyl of Eggs is good also to anoynt them with. Yet sometimes these Tetters are so fierce, that no Remedies can cure them. I shall set down

Another,

that I have used with admirable success, when they were inveterate. In a Glass of sharp red-Wine, boyl a drachm of Mercury sublimat; then wash the place with it morning and evening: let it dry of itself. Do this three or four times, and the Tetters will away, and never come again.

Another.

Take Salt-Peter, three ounces; Oyl of bitter Almonds, two pound; of Squils, half a pound; one Lemmon without the Pills: mingle them, and let them ferment three days: then, with Chymical Instruments, extract the Oyl, and anoynt your Tetters therewith, and they will be gone, though they seem to turn to a Leprosie.

CHAP. XXIII.

How Warts may be taken away.

Warts use to possess the Fore-head, Nose, Hands, and other open places: so doth hard Flesh, and other foulness of the skin: women cannot endure them. I found out Remedies against these deformities of the skin.

Against Warts.

The Ancients used the greater Spurge, whose juice, anoynted on with Salt, takes them away: and therefore they called it Warts-Herb. There is also a kinde of Succony, called Verrucaria from the effect: for if one eat it but once in Sallets, all the Warts will be gone from any part of the Body: or, if you swallow one drachm of the Seeds.

Another.

This one, and so no more. There is a kinde of Beetle that is Oily, in Summer you shall finde it in Dust and Sand in the way; if you rub that on the Warts, they will be presently gone, and not be seen. You may finde these, and keep them for your use.

CHAP. XXIV.

To take away wrinkles from the Body.

Many parts of the Body use to be wrinkled, as the Hands, Face, Belly after Child-bearing; and the like. To contract the Skin therefore do thus:

For a wrinkled Forehead,

the

the Dregs of Linseed-Oyl is good: or Lees of Oyl of Olives; putting unto it a little Gum-Arabick, Tragacanth, Mastick and Champhire: it is good also for flagging Breits.

For a wrinkled Face.

When Eggs are boyled hard in water, cut them in the middle, fill the holes where the yelks were, with Powder of Myrrh: then cover one with the other half, and binde them with a Thread, that they come not asunder: then take a glazed earthen Vessel, with a broad mouth, and lay sticks across it, that the Eggs may lie upon them hanging neer the bottom: let the cleft of the Eggs hang toward the bottom: put the earthen Vessel into a chest of Osiers, and let it in a Well; let it hang one foot from the water; by the moisture whereof, the Myrrh will dissolve into Oyl of water: anoynt your Face with it. The juice of the green Canes of the Pine-Tree, but it is weaker then the distilled water, being applied to the Face, with a Linnen-cloth wet therein, will take away all wrinkles from the Face excellently well. You have

Another.

Steep Kidney-Beans in Malmsey, one day; then take away the black whence they sprout, and distill them with Lemmons and Honey. Take a quantity of old Cow-Beef, and distill that also; mingle the waters, and set them in the open Air, in a Glass-Vessel in the Sun for fifteen days, and wash your Face morning and evening therewith.

Another.

Crop in the morning the Flowers of Mullens, and steep them in Greek-Wine, with the Roots of Solomons-Seal: then receive the water distilled in Glass-stills: and if a woman, when she riseth out of her bed, wash her face with this, she will be very fair: and if you would take off the wrinkles with the same water, add distilled water of Lemmons thereunto, and it will make you glad to see the effect. But this is the best

Water to whiten, plain, and beautifie the Face.

Take equal parts of the Root of Solomons Seal, greater Dragons and lesser, Spargrafs, Bryony, and white Lillies, as much as you please: bruise them a little, and cast them into an earthen pot with a large mouth; let it be glazed: pour on Greek Wine that may cover all: add to these juice of Lemmons a fourth part, ten new Eggs bruised with their shells, and Land-Snails without shells; let them infuse a while: then distill them at a gentle fire, and keep the first water a part: then augment the fire, and keep the second; that will be stronger: for this wipes all spots and red pimples from the Face. Some mingle with this, water of Bean-Flowers, Elder, Poppy, Honey-Suckles, and the like; so do they take away all wrinkles and spots coming from the Sun, and all the rest. But you may thus take off

The wrinkles of the Belly after child-birth.

Untipe Services are long boyled in water: with these mingle whites of Eggs, and water wherein Gum-Arabick is dissolved: wet a Linnen-cloth in such water, and lay on the Belly; or mingle the Powders of Harts Horn burnt, the Stone Amiantus, Salt-Ammoniac, Myrrh, Frankincense, Mastick, with Honey; and it takes away all wrinkles.

CHAP. XXV.

Of Dentifrices.

Dentifrices are used amongst things to beautifie women: for there is nothing held more ugly then for a woman to laugh or speak, and thereby to shew their

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rugged

rugged, rusty, and spotted Teeth: for they all almost, by using Mercury sublimate, have their Teeth black or yellow: and because they stand in the Sun when they would make their Hair yellow, their Teeth are hurt thereby, and grow loose, ready to fall out; and do oft-times. I shall shew first how to make black Teeth white as Pearls; then how to make flesh grow about such as are weak and bare of Gums, and to make them strong. But of old were made

Dentifrices

of the shells of Purples, and others like trumpets burnt. The Arabian-stone it is like the spotted Ivory; burned, it is good for Dentifrices. Also, of Pumex-stone very profitable Dentifrices were made. *Pliny*. So with the Powder of Ivory rubbed on, the Teeth were made as white as Ivory. *Ovid*.

*That Teeth may not grow black forborn,
With Fountain-water wash them every morn.*

I shall add

Another

that I use. The Crums of Barley-bread burnt with Salt sprinkled on, and Honey, will not onely make the Teeth white, but makes the Breath sweet. Also, with red Coral, Cuttle-bone, Harts Horn, and such-like, whereof every one will well polish and wipe the Teeth clean: so doth also the Grains of Cochinele. Also, there is made a water of Allom and Salt distilled, that whiteneth the Teeth exceedingly, and confirms them; but the Oyl of Sulphur doth it best: for it smooths them and wipes away all spots: and if any one think it is too strong, it may be qualified with the water of Myrtle flowers. Make a Tooth-scraper after the fashion of a Tooth, and pour on Oyl, and rub the spots therewith: but be careful it touch not the Gums, for it will whiten and burn them: rub so long till the spots be gone, and they be very white. I have now described the most perfect Remedy.

CHAP. XXVI.

To hinder the breasts from augmenting.

Amongst the Ornaments of women, this is the chief, to have after Child-bearing, round, small, solid, and not flapping or wrinkled Breasts. So we may

Hinder the augmenting of the Breasts,

if we will. Bruise Hemlock, and lay a Cataplasin thereof with Vinegar to womens Breasts, and it will stay them that they shall not increase; especially, in Virgins: yet this will hinder milk, when it should be seasonable. But if you will

Cure soft and loose Breasts,

Powder white Earth, the white of an Egg, sowre Galls, Mastick, Frankincense; and mingle them in hot Vinegar, and smear the Breasts therewith: let it stay on all night. If it do not effect it, do the same again. The Stones of Medlars are good for this also; urripe Services, Sloes, Acacia, Pomegranate Pills, Balanitia, urripe Pine-nuts, Wilde Pears, and Plantain; if they all boil in Vinegar, and be laid to the Breasts, or some of them. The Antients commended for this purpose a Whetstone of Cypres, that we sharpen Iron upon, to restrain Virgins Breasts, and not let them grow big. *Dioscorides*. But *Galen* saith, That it not onely stops the encrease of the Breasts, but will hinder childrens Testicles from growing: but I use the juice of Ladies Mantle from the Leaves of it, and I wet Linen in it, and lay it on the Breasts, and renew it; for it will not onely hinder Virgins Breasts from increasing, but will lessen the loose Breasts of Marrons, and make them firm. It is more effectual to use the decoction of the Herb; and if you joyn any of the forementioned things there-

therewith, as Hypocistis, Pills of Pomegranates, and the like. So water distilled from green Pine Apples, will draw in loose Breasts, and make them like the round, hard, solid Breasts of Virgins.

CHAP. XXVII.

How the Hands may be made white.

THe Hands must not be forgotten, but we must make them white also, smooth, and soft, that are Ornaments of the Hands to be desired. But how whiteness and smoothness may be obtained, I have shewed already; softness remains, which is only given to fair Hands.

To make the Hands as white as Milk.

Take things that are Milk-White, as Almonds, Pine-Kernels, Melon and Ground-Seeds, and the like. Therefore bruise bitter Almonds, Pine-Kernels, and Crums of Bread: then make Cakes of them with Barley water, wherein Gum Tragacath hath been soaked. You may use this for Sope, when you wash your Hands; for they kowre them, and make them white. I

For the same,

use oft-times bitter Almonds, half a pound: put them in hot water to blanch them: then beat them in a Marble-Mortar. Afterwards, take the lesser Dragons, two ounces; Deers Suer and Honey, of each as much: mingle them all in an earthen Pot with a large mouth: set them at the fire, and let them be stirred gently with a wooden-stick that they mingle well: put it up in Boxes for your use. If you will have

Your hands white,

wash fresh Butter nine times in sweet water, and last of all, in sweet-scented Rose-water, to take off the ill smell; and that it may look as white as Snow, then mingle white wax with it, and a good quantity of Oyl of sweet Almonds. Then wash your gloves in Greek Wine, as the manner is, and smear on the foresaid mixture: put on these when you go to bed, that all night they may grow soft by the help of such things. Then take Peach-Kernels, with the skins picked off, Seeds of Gourds, Melons, white Poppy, Barley-meal, of each one ounce and half: the juice of two Lemmons, rosted in the Embers: mingle these with as much Honey as will make them thick as an Oyniment: and to make them smell well, you may add a little Musk or Civer, when you go to bed; but in the morning wash them with Fountain-water: and for Sope, use the Lees of Oyl of Nuts well pressed forth, or Lees of Oyl Olive. Others use this Liniment onely. Press the Cream out of Lemmon-Seeds; with two ounces of it, mingle one ounce of Oyl of Tartar, and as much Oyl of Almonds. When at night you go to bed, wash your Hands in Fountain-water; dry them, and anoynt them with this Liniment, and put on your Gloves. Take

Another.

For one weeks-time, infuse the Marrow of Ox bones in cold water; but change the water four or five times a day; and for every pound of Marrow, take six excellent Apples, and cut them in the middle, and cast forth the Seeds and Core: then beat them small in a Marble-Mortar, and put them into a new Mortar, that they may smell the sweeter: adding a few Cloves, Cinnamon, Spikebard; let them boyl in Rose-water. When they are all very soft, take them forth and strain them, and again add a sharp Lixivium, and let them boyl at a gentle fire, until all the water be washed. Then let them up in a Gla's Vessel for your use, or make them into morsels. That which follows is good

For the same.

Make a hole in a Lemmon, and put into it Sugar-Candy and Butter, and cover it with

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with the Coyer: wet Hards of Hemp, and wrap it up in, and boyl it in hot Embers, and that it grow soft by rotting: when you go to Bed, anoynt your hands with it, and put on your Gloves.

CHAP. XXVIII.

How to correct the ill sent of the Arm-pits.

THe stink of the Arm-holes makes some women very hateful; especially, those that are fat and fleshy. To cure this, we may use such kinde of Experiments. The Ancients against the stink of the Arm-pits, used liquid Allome with Myrrh to anoynt them: or the Secrets and Arm-holes were strewed with the dry Leaves of Myrtles in powder. The Roots of Artichokes smeared on, doth not onely cure the ill sent of the Arm-pits, but of the whole Body also. But *Zenserates* promiteth by Experiment, That the faultiness of the Arm-pits will pass forth by urine; if you take one ounce of the pith of the Root boyled in three Lemons of Muskadel to shreds; and after bathing, fasting, or after meat, drink a cup thereof. But I am content with this. I dissolve Allome in water, and I wash the Feet and Arm-pits with it, and let them dry: so in some days we shall correct the strong smell of those parts; But it will be done more effectually thus. Pown Lytharge of Gold or Silver, and boyl it in Vinegar; and if you wash those parts well with it, you shall keep them a long time sweet: and it is a Remedy, that there is none better.

CHAP. XXIX.

How the Matrix over-widened in Child-birth, may be made narrower.

T*Rotula* saith, we may honestly speak of this, because Conception is sometimes hindered by it, if the Matrix be too open; and therefore it is fit to lend help for such an impediment. For some women have it stand wide-open by reason of their hard labour in Child-birth; and if their Husbands be not content with it, that the men may not abhor the women, it is thus remedied. Take Dragons Blood, Bole-Armeniac, Pomegranate-shells, white of an Egg, Mastick, Galls, of each one ounce: powder them, and make them all up with hot water. Put some of this Confection into the hole that goes into the Matrix. Or, Galls, Sumach, Plantain, great Comfrey, Allome, Chamælea: take equal parts of them all, and boyl them in Rain-water, and foment the Privities. Or, beat sowre Galls very finely: mingle a little of the Powder of Cloves with them. Let them boyl in sharp red Wine: wet a woollen cloth in it, and apply to the part. Or thus may you restrain that part of common whores, with Galls, Gums, whites of Eggs, Dragons Blood, Acacia, Plantain, Hypocistis, Balanitia, Mastick, Cypress-nuts, Grape-skins, Akorn-cups. Or, in that hollow part where the Glans breaks forth; and gaping, shews the Nucleus, with Mastick and Terra Lemnia. If all these be boyled in red Wine or Vinegar, and the Matrix be often wet therewith, it will come very close, and be much straighter. Or else powder all these, and cast them in through a Reed, or make a fume under them. Great Comfrey will be excellent for this purposes for flesh boyl'd with it, will grow together. And the other also, if it be boyl'd, will very well glew together fresh Wounds. The Decoction of Ladies Mantle, or the juice, or distilled water of it, cast into the Matrix, will so contract it, that Whores can scarce be known from Maids: or, if they fit in the Decoction of it; especially, if we mingle other stringent things with it, and wet the Secrets therewith. The distilled water of Starwort, being often injected into the Matrix, will make one scarce know which is corrupted, and which is not. But if you will have

A woman deflowered made a virgin again,

Make little Pills thus: Of burnt Allome, Mastick, with a little Vitriol and Orpiment: make them into very fine Powder, that you can scarce feel them: when you have

have made them Pills with Rain-water, prels them close with your fingers; and let them dry, being pressed thin, and lay them on the Mouth of the Matrix, where it was first broken open: change it every six hours, always fomenting the place with Rain or Cistern-water, and that for twenty four hours, and it will here and there make little Bladders; which being touched, will bleed much blood, that she can hardly be known from a Maid. Midwives that take care of this, do it another way: They contract the place with the Decoction of the forementioned things, then they set a Leech fast on upon the place, and so they make a crusty matter or scab; which being rub'd will bleed. Others when they have straightened the part, inject the dried Blood of a Hare or Pigeon; which being moistned by the moisture of the Matrix, shews like like fresh Blood. I found out this noble way: I powder Litharge very finely, and boyl it in Vinegar, till the Vinegar be thick; I strain out that, and put in more, till that be coloured also: then I exhale the Vinegar at an easie fire, and resolve it into smook.

CHAP. XXX.

Some sports against women.

THas far I have shewed how to beautifie women, now I shall attempt some things against their decking of themselves, and make some merriment after those things that I seriously discovered to adorn them.

To make a painted Face look pale.

If you would know a painted Face, do thus: Chew Saffron between you Teeth, and stand near to a woman with your mouth: when you talk with her, your breath will foul her Face, and make it yellowish; but if she be not painted, the natural colour will continue. Or burn Brimstone in the room where she is: for if there be Cerufs or Mercury sublimare on her Face, the smook will make her brown, or black. The painted Women that walk at Puteoli, in the Mountains of Phlegra, are made so black, as Silver-money is, shut up in bags. We may also know thus,

Whether she be painted with red.

Chew Grains of Cummin, or a Clove of Garlick, and speak close by her; if it be natural, it will remain; but counterfeit with Cerufs or Quick-silver, it presently decays.

To make a woman full of red pimples.

Of a Stellio is made an ill Medicament: for when he is dead in Wine, all the Faces of those that drink of it, will be red-spotted. Wherefore, they that would disfigure Whores, kill him in an Oynment. The Remedy is, the yolk of an Egg, Honey and Glaſs. *Pliny.*

To make the Face green.

Avicenna saith, That the Decoction of Chamæleon, put into a bath, will make him green-coloured that stays long in that bath; and then by degrees he will recover his former colour.

To make the Hair fall off the Head and Beard.

Touch any part of mans body with a matter white as milk, that the Salamander vomits up out of its mouth, and the Hairs will fall off; and what is touched is changed into the Leprosie. *Pliny.*