

**Arcana microcosmi: or, the hid secrets of mans body disclosed: first, in an anatomical [sic] duel between Aristotle and Galen, about the parts thereof. Secondly, by a discovery of the ... diseases, symptomes, and accidents of mans body. With a refutation of Doctor Brown's Vulgar errors, the Lord Bacon's Natural history, and Doctor Harvy's book De generatione, Comenius, and others; whereto is annexed a letter from Doctor Pr. [i.e. Primrose] to the author, and his answer thereto, touching Doctor Harvy's book ... / By A.R.**

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1652





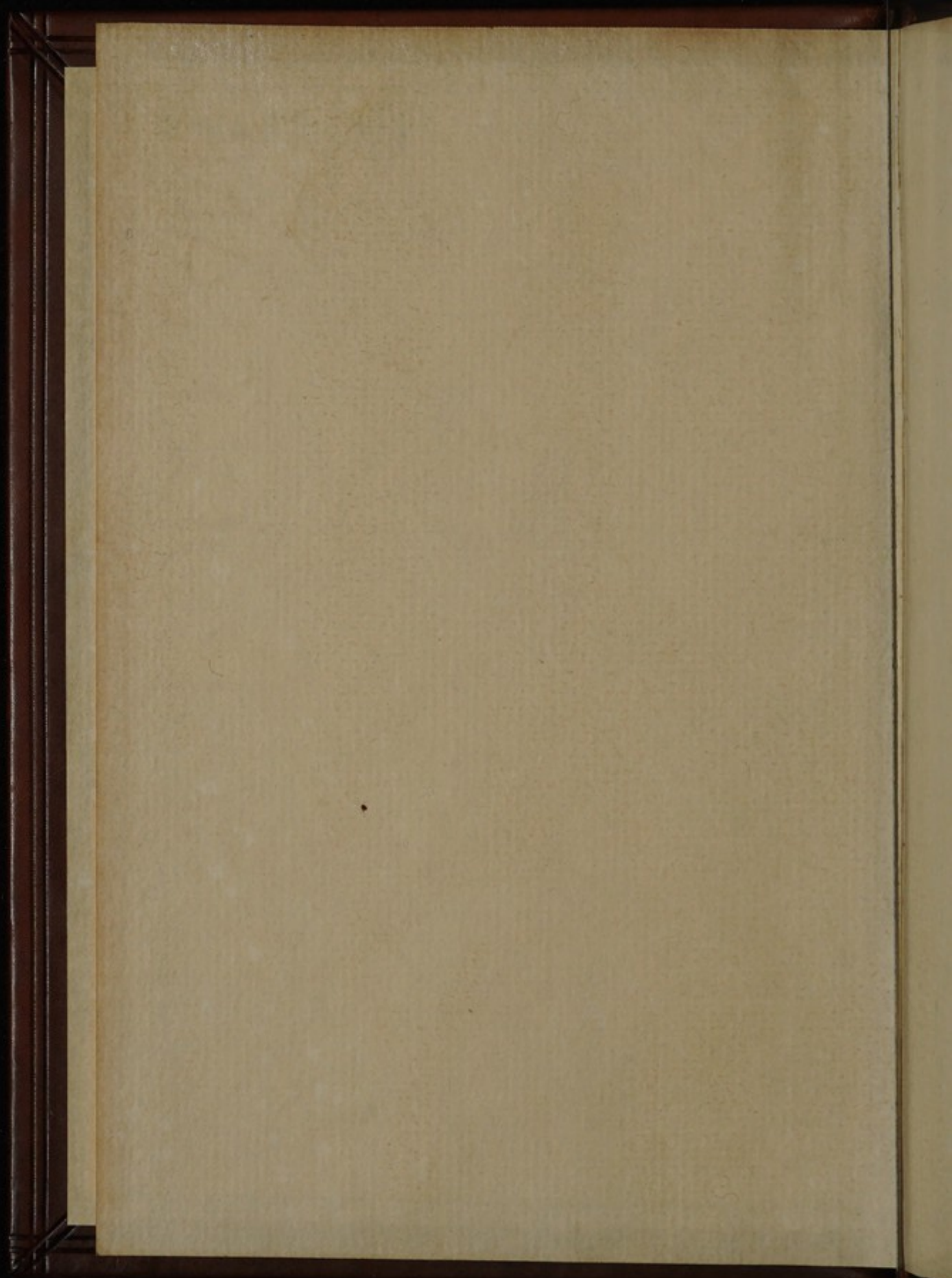




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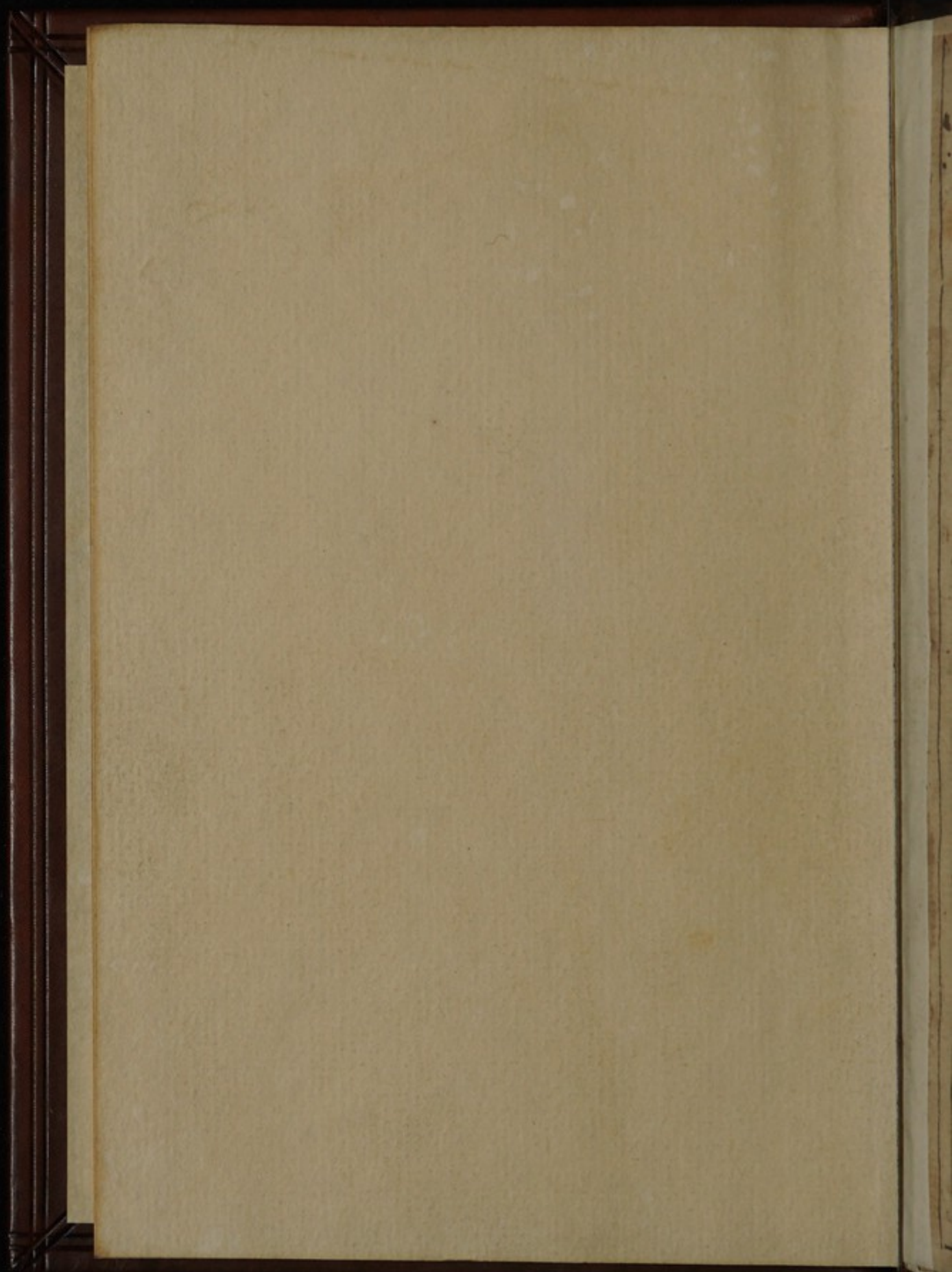














*Tho. Matthew*  
**Arcana Microcosmi: 170**

O R,

The hid Secrets of M A N's Body discovered;  
In an Anatomical Duel between *Aristotle* and  
*Galen* concerning the Parts thereof:

As also,

By a Discovery of the strange and mar-  
vellous Diseases, Symptomes & Accidents  
**of M A N's BODY.**

W I T H

A Refutation of Doctor *Brown's*  
**VULGAR ERRORS.**

The Lord B A C O N's  
**NATURAL HISTORY,**

And Doctor *Harvy's* Book

**DE GENERATIONE**  
**COMENIUS,** and Others;

Whereto is annexed a Letter from **Doctor P.**  
to the Author, and his *Answer* thereto, touching  
Doctor *Harvy's* Book de Generatione.

By **A. R.**

London, Printed by *Tho. Newcomb*, and are to bee sold  
by *John Clark*, entring into Mercers-Chappel, at  
the lower end of Cheapside, 1652.



WILLIAM A. HICCOCK

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TO THE  
WORSHIPFUL


and my much honored

FRIEND,

EDWARD WATSON,  
ESQUIRE,

Son and Heir to the Right Honorable,  
the Lord ROCKINGHAME.

SIR.

hen I consider your proficiency in the Schoole  
of Wisdome, your daily exercises in the Tem-  
ple of Vertue, for which you may in time de-  
serve a Shrine in the Temple of Honor; your hearty  
affection to true and solid Philosophy; not that which  
the Apostle calls Vain and deceiving; and lastly, your  
sincere love to me, I thought good not in way of retalia-  
tion, but of a thankfull recognition of your favours, to  
present this piece to you, wherein you may perceive how  
many strange wonders and secrets are couched up  
within the Microcosme of our body; and with what ad-  
mirable artifice the base and infirm materials of this  
our earthly Tabernacle are united and composed.

A 2

Likewise



## The Epistle Dedicatory.

Likewise you may see how much the Dictates and Opinions of the ancient Champions of Learning, are sleighted and misconstrued by some modern Innovators; whereas we are but children in understanding, and ought to be directed by those Fathers of Knowledge: We are but Dwarfs and Pigmies compared to those Giants of Wisdom, on whose shoulders we stand, yet we cannot see so far as they without them: I deny not but we may and ought to strive for further knowledge, which we shall hardly reach without their supportation. I dissuade no man from inventing new; but I would not have him therefore to forget the old, nor to lose the substance whilst he catches the shadow. Women and Children love new wine, because pleasant to the palate; but wise men chuse the old, because wholsomer for the stomach. As I abridge no man of his liberty to invent new wayes; so I hope they will not debar me of the like liberty to keep the old paths, so long as I find them more easie and compendious for attaining the end of my journey. Sir, I will not trouble you with any larger Discourse on this subject. I wish an accumulation of all vertue and happinesse on you, and withall the continuation of your love to him who professeth himself

Your humble servant,

Alexander Ross.





## The Contents of each Chapter in these foure Books.

### CHAP. I.

1. The Heart's dignity, situation, priority, necessity, and use. 2. The Heart first formed, not all the parts together. 3. The Galenists Objections answered. 4. How the heart is perfect before the other members, and how nourished. 5. All the temperaments united in the Heart. 6. Three ventricles in som Hearts. 7. The Heart nervous. 8. No parts more spermatical then others. 9. The Liver, not the first that is formed. 10. The Heart the seat of Bloud and nourishment. 11. The heat of the Matrix not generative. 12. The right Ventricle nobler then the left. 13. The vital and nutritive faculties are the same. 14. Heat the cause of the Hearts motion. 15. The Heart was first formed and informed. 16. There is but one principal member in the body, not many.

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### CHAP. III.

1. Why the heart the originall of sensation, and how it feeleth. 2. The brains being cold cannot beget sensitive spirits: Why the animal spirits most active where is most heat. 3. There can be no generation of the animal spirits out of the vitall, without the corruption of the vitall, which is impossible: The animal spirits are not begot of the aire. 4. Neither are they concocted or generated in the ventricles of the brain, nor are they wasted. 5. The brain is not the originall of sense and motion, although these fail upon the



## The Contents.

hurt of the brain. 6. Why upon the distemper of the heart, there is no failing of sense and motion. 7. The nerves are not from the brain, though they be like; but indeed they are not like the brain. 8. Why the nerve of the heart loseth sense and motion beneath the knot, not above it. 9. The brain is the coldest of all the parts how void of veins and blood, how hot, and the cause of hairs. 10. The blood and spirits alter not the brains temper. Why its coldness is not felt: the pith in the back bone hot. 11. Why the brain and heart at such a distance: by the spirits they work on each other. 12. Why both the brain and lungs were made for refrigeration. 13. The mans brain larger then the womans: why man hotter then Lions. 14. The testicles ignobler then the heart and brain. 15. The heart, not the testicles, the cause of sensation and generation; the testicles not chief because necessary, or because they cause an alteration in the body, from whence is the distinction of sexes. 16. The seed receiveth its specificall form from the heart. 17. Why Eunuchs fatter, weaker, and colder.

### Lib. II. CAP. I.

1. Mans Body fitted onely for mans Soul. Tritons are not men. 2. How Mans body is more excellent then all others. 3. How the Soul is most in the Brain and Heart. 4. A twofold heat in us. 5. What Creatures nourish most. 6. The Womans imagination cannot alter the form.

### CAP. II.

1. The Stomach and Lungs not necessary for life. 2. How the limbs are moved: the spirits are bodies more required for motion then sensation: the spirits are light: how they are the souls instruments: how the Muscles move. 3. Seven properties of the brain. 4. Twelve properties of the eye. 5. Its substance watrish. 6. Why but one sight. 7. The eye how an agent and patient. 8. Its two lights and its colours. Light gives the second act.

### CAP. III.

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4. Adept how generated. Of the Lungs, they are hot.

### CAP. V.

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2. The actions of our members.
3. There are no spermatical parts.
4. The bones, nerves, veins, &c. why not easily reunited.
5. The spermatical parts hotter than the sanguineal.
6. The brains and scull, bones and teeth compared.

### CAP. VI.

1. Two sorts of blood; the heart first liveth, and is nourished, and the original of blood, not the liver.
2. The hearts action on Vena cava; the cause of sanguification.
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5. Heart the first principle of the nerves.
6. Nerves, how instruments of sense and motion.
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6. The bladder, its attraction and expulsion.

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3. The menstruous blood no excrement, how it is : The cause of the small pox : Its evacuation.
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2. How made for refrigeration only, how hot, cold, and moist; and why; its actions.
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CPAP



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5. That old men may become young again, proved.

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The Corruptions

CHAPTER IV

The first of these is the corruption of the word of God. This is done in two ways. First, by the addition of words which are not in the original text. Second, by the omission of words which are in the original text. Both of these are done in order to make the text more agreeable to the prejudices of the people.

CHAPTER V

The second of these is the corruption of the sense of the word of God. This is done in two ways. First, by the addition of words which are not in the original text. Second, by the omission of words which are in the original text. Both of these are done in order to make the text more agreeable to the prejudices of the people.

CHAPTER VI

The third of these is the corruption of the meaning of the word of God. This is done in two ways. First, by the addition of words which are not in the original text. Second, by the omission of words which are in the original text. Both of these are done in order to make the text more agreeable to the prejudices of the people.



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*Arcana Microcosmi :*

O R,

The hid Secrets of MAN's BODY discovered.

W I T H

A Refutation of Doctor BROVNS  
VULGAR ERRORS,

My Lord BACON's *Naturall History;*

A N D

D<sup>r</sup> HARVEY's Book *De Generatione.*

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CHAP. I.

1. The Hearts dignity, scituation, priority, necessity, and use. 2. The Heart first formed, not all the parts together. 3. The Galenists Objections answered. 4. How the heart is perfect before the other members, and how nourished. 5. All the temperaments united in the Heart. 6. Three ventricles in som Hearts. 7. The Heart nervous. 8. No parts more spermatical then others. 9. The Liver, not the first that is formed. 10. The Heart the seat of Bloud and nourishment. 11. The heat of the Matrix not generative. 12. The right Ventricle nobler then the left. 13. The vital and nutritive faculties are the same. 14. Heat the cause of the Hearts motion. 15. The Heart was first formed and informed. 16. There is but one principal member in the body, not many.



S in all States and Kingdomes there have ever been factions and sidings, so have there been still oppositions in the Common-wealth of Learning; amongst many others, there are two great factions concerning the fabrick of Mans Body; namely, the *Peripatericks* and *Galenists*; so that in Rome there was not greater emulation between the *Pompeians* and *Cesarians*, then there is between the *Philosophers* and *Physicians*.



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*sitians* in the points of Anatomy: I stood as neuter a long time, but at last being evinced by the multitude and strength of *Aristotelian* reasons am forced to side with them against the *Galenists*; but so, that I do what I can to reconcile them in some things, and to make peace; for, *Nulla salus bello*.

I. I will therefore briefly set down the reasons that have induced me to side with the *Aristotelians*. And first concerning the Heart: I finde that it is the first member that lives and is formed in our bodies; and consequently the noblest and chiefest of all our members, whatsoever the *Galenists* say to the contrary. For 1. The Heart is placed in the midst of the breast, as the Sun in the midst of the world, that it might impart its vital heat and motion to all parts: So the seed is in the midst of the fruit. 2. Where there is a *medium* there must needs be *extreams*; but we finde in mans body this *medium*; to wit, that there are some parts which both give and receive life and motion; therefore there must be some that receive but give not; and consequently some that give but receive not; and this must be the heart, or brain, or liver: for to make more originals then one, is needless, seeing Nature always tends to, and aims at unity. Now that the heart is this principal, appears by these reasons. 3. First, that is most likely to be the originall of life, sense, and motion in other members, which is most apt and capable of these; and so, that had first life and motion, which had the greatest inclination and aptitude to receive them; but the heart of all other parts is most apt to receive these from the formative faculty: Therefore doubtless this faculty in the seed, would first produce the heart, as being a matter prepared to receive first the impressions of the formative. 4. What the heart is in Animals, that the root is in Vegetables; but the root is the first thing the plant thrusts out; therefore the heart is first formed. 5. The heart dieth last, therefore it lived first: for this method Nature observes, that the parts which are last made, decay first, as the eies and teeth; and consequently that decayeth last, which was framed first. 6. They that have been curious by inspection into eggs, to observe Natures progress in the generation of the chick, have found a red spot the third day, which had a motion like palpiration; this could be nothing else but the heart. 7. The other members cannot live without the heart, but the heart can live without the other members, as I have seen a Monkeys heart live a great while after it hath been taken out of the body: If then the life of the other members depends from the heart,  
and



and not the heart from them, the heart must needs be the first that liveth.

8. The heart imparts the vitall heat to the other parts, it must therefore have existence before the other parts; for operation follows the existence. 9. The formative power of the seed doth not operate but by the vital heat of the heart; therefore this must be first, before that can operate. 10. The matter cannot be disposed, to receive the form of the members, nor can the parts be distinguished one from another, without the heat and motion of the heart. 11. Nature in her operations aims at an end; but where there is an end, there is order; and where there is order, there is priority, and something that was first.

II. There are some who hold that the heart is not first generated, but that all the members are at the same time begot and formed together: But this cannot be so; for in the Embryo we see that all the parts are not equally articulated and figured, but some sooner, some later. 2. We see this in art, which imitates Nature; for the artificer carves and figures one part before another. 3. We see the teeth are begot long after the other parts; for nature produceth the members as there is use of them; the infant needs no teeth whilst it feeds on milk. 4. If all the parts are at the same time framed and articulated, then all the body is at the same time perfected; but this is not Natures work, which proceeds by degrees to perfection, having imperfect beginnings.

III. The *Galenists* object, that Nature had to no purpose made the heart before the rest of the body, seeing there is no use of the heart till the body be formed. I answer, there is a two-fold use, namely, of Animation, and of preparation; the heart could not animate the body before it was, but it could prepare the matter by its vital heat and motion to receive the impression and influence of the formative power, working by the heart on the matter; the heart then is usefull, not only to the body after it is generated but also whilst it is in *Fieri*; and in generation, the heart is the foundation of the whole corporeal Fabrick; we cannot say the foundation is needless, because it is laid before the house is built; for though it doth not support the superstructure before it be, yet it is ready and fitted to support it, when it shall be: Neither will it follow, that because the house before it is built needs no foundation, therefore the foundation must not be first laid. There is need of priority and order; the building needs it, when it shall



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be, and the builder needs it before it be: though the body not yet formed needs not the heart, yet the formative power needs it. Secondly, they object that the formative power is common to all the parts alike, having no more relation to one then to another; and therefore works upon them all alike, and produceth them together. I answer, God is the common and universal cause of all his creatures; yet he did not create them all in one day; the universality of the cause, excludes not the order of casuality; nor is the common relation it hath to the effects, any reason of producing them all at one time. Again, though the formative power hath an equal relation to all parts, as they are parts; yet it hath a nearer relation to the heart, as being its organ, by which it works on the other parts.

IV. If it be asked whether the heart be perfect or imperfect before the other members be articulated. I answer; It is perfect, if it be compared with any other member, but imperfect if compared with the whole *compositum*. Again, it is imperfect to what it shall be, when it shall be fitted with all necessary Organs for animation. 2. If again it be asked, how the heart can live without nutriment, seeing the liver by blood feeds it. I answer, though the liver be not yet formed, yet the heart is nourished by some adjacent matter, as the chick is by the yeolk of the egg; and this nourishment sufficeth the heart, till blood, a perfect nutriment be prepared. Again, the nutritive faculty doth not flow from the liver, as the vitall from the heart, but it is inherent and implanted into every part, as well in the heart as in the liver; whereas the vitall is implanted only in the heart, and from thence flowing into every member. Lastly, we may say that the heart needs no food, till there be a depedition, or wasting of its substance.

V. The unity of the vegetive soul cannot be preserved in so many different temperaments; or the body, (for there are as many as there are parts) if it were not for the common temperament of the heart, in which all the others are united, receiving from thence heat and spirits: It was needfull then that the heart should be first formed, as being the common originall of all the other parts, all which may be said to have but one common temperament, and one soul, because there is but one heart.

VI. Though the *Galenists* affirm that the heart hath but two ventricles; yet the *Aristotelians* in affirming three in bigger creatures, seem to speak more reason: For if in bigger animals there is greater store of spirits, and a greater elaboration of them.



them, then in the lesser, it stands with reason that their hearts being bigger, should have also more receptacles for containing the vitall blood and spirits, then the lesse.

VII. It stands also with reason, that the substance of the heart is nervous, that it might be the more firm and solid. 2. Because the heart is the original of motion, which is performed by the nerves. 3. Because the substance of the veins and arteries, whereof the heart is the originall, is nervous.

VIII. The parts which the *Galenists* call *Spermaticall*, are not made of the *Sperma*, or Seed, more then any other parts are, but of the dryer and more solid parts of the blood, as the *Sanguineall* are of the thinner parts thereof. 2. The males seed is onely active, the woman hath no other seed then the menstruous blood, which is meerly passive; in both which seeds there is a power or potentiality of generation; the active in the male, the passive in the female, both which are from the heart. In this also I subscribe to *Aristotle*.

IX. I cannot assent to the *Galenists*, in affirming the liver rather then the heart to be the first that lives in us, and therefore the original of other parts, because it is bigger, and nearer to the matrix, then the heart; for the *Aristotelians* say well, that the original of things consisteth not in bulk, but in vertue; the seeds of trees and plants are least in bulk, and yet are the originals of great bodies. 2. The vicinity to the matrix is not the cause of priority; for the matrix is the place of, but not an agent in generation; the agent is only the formative faculty in the seed.

X. Both *Aristotelians* and *Galenists* affirm, that the child at first lives the life of a plant; but from hence the *Aristotelian* concludes, that the heart is the first members begot in us, because it is answerable to the root in plants, which is first generated; but the *Galenist* infers, that the liver must be the first member, because the child living the life of a plant, hath no other faculty but nutritive, which is the faculty of the plant, the seat whereof is in the liver. But here I side with *Aristotle*, because the liver is no more the seat of nutriment then the heart: And because the heart is as the root; but it is by the root the plant lives and is nourished: And if the liver be the seat of nutriment, because of the blood thereof; I should rather say the heart is this seat, because we finde blood there out of the veins, as in a cistern; but in the liver there is no other Blood, then what is in the veins: Neither can the liver be the originall of the nutritive power, because there is the sense of indigence



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indigence or want ; for so the stomach should rather be this originall, because there is the most exquisit sense of want.

XI. The liver cannot be generated without heat and spirits ; but the seat of heat and spirits is the heart, therefore this must be first. If any will say that the heat of the matrix is sufficient ; I deny it ; for that heat is onely conservative, not generative ; it hardeneth and consolidateth the outward parts, but doth not produce the inward.

XII. *Aristotle* will have the right ventricle of the Heart the nobler ; *Galen* the left ; but I subscribe to *Aristotle* ; because I finde that the right Ventricle liveth longer then the left. 2. That the Pulse in the right side of him that is dying, is more valid then in the left side. 3. The right ventricle leans upon the lungs as upon a Cushion or supporter, Nature shewing as it were, a greater care of this then of the other. 4. The right parts are nimbler and stronger then the left, because they are hotter. 5. Though the spirits receive their completion in the left ventricle, yet they are prepared and fitted in the right ; and therefore there needs not so great a heat in the left ventricle, as the *Galenists* speak of ; for a moderate heat will suffice to perfect that which is already begun. 6. The left ventricle is but a servant to the right, in finishing that work which was begun by the right, and distributing it into the body, being finished.

XIII. The *Aristotelians* make the vital and nutritive faculty the same ; the *Galenists* make them distinct ; but the *Peripateticks* reason prevails with me, which is this ; That where there are distinct faculties, there must be distinct operations, because the faculty is for the operation ; But there are no distinct operations of the vital faculty, from that of the nutritive ; for accretion, diminution, and generation are actions of the vital or nutritive : Sense and motion are actions of the animal faculties. 2. Life is the presence of the soul in the body ; this presence consists in action, this action is nutrition ; for when this action fails, life fails ; because the chief and first action of the living creature is to preserve it self, which cannot be without nutrition ; seeing nutrition is not without tact in the sensitive creature ; but when tact faileth, animality must needs fail.

XIV. The *Aristotelians* make heat the efficient cause of the hearts publick motion : Others will have the soul ; Others, the vegetive faculty ; but *Aristotle* is in the right ; for the soul works by its faculties, and these by heat ; so that heat is the immediate cause of this motion, and the souls instrument



ment ; yet not such an instrument as worketh nothing but by the force of the principal agent ; for the heat worketh by its own natural force , though it be directed and regulated by the soul ; the heat then of the heart rarifying the blood into vapors, which require more room, dilate the heart ; but by expelling some of these vapors into the arteries, and receiving also some cold air by the lungs, the heart is contracted , this is called *Systole* , the other *Diastole* : And as heat is the efficient cause, so it is also the end of this motion. For therefore doth the heat move the heart, that it by this motion might impart heat to the body. But I understand not here by heat, a bare quality , but that which is called [*Calidum innatum*] If it be objected, that there is in Plants a vegetive faculty and heat, but not this pulsifick motion, nor yet in effects. I answer; the reason is , because there are not instruments fit for such a motion, nor is there any use of it. 2. This motion of the heart is local not totally, but partially ; for not the whole heart, but the parts thereof change their place or seat , and so in this regard augmentation and diminution are local motions.

XV. That the heart is not only first formed, but is also first informed, and first exerciseth the action of life , is plain by this reason drawn from the *Peripateticks* : the heart was made at first an Organical member; but that could not be, if it was not first informed by the soul, which is the first act of the organical body : and if it was made organically, it had been made to no end , and nature had been idle , to have made an useless member , which could no more deserve the name of heart, then a blinde eye , the name of eye : But the soul that I speak of here, is the vegetive or sensitive resulting out of the matter, which is first prepared in the heart for reception of it; and not the reasonable soul , which with all its perfections is created and infused by God , into the whole body after it is articulated , and made capable of such a noble Guest.

XVI. The *Aristotelians* are more rational in placing but one principall member in the body , then they who place either three or four : For it is needless to make so many principals, when as one will suffice : Nature aimeth always at unity ; for all the five senses are united in one common-sense ; all the members in one body; all the different specificall parts of the world into one common nature ; so all the members into one heart , which hath in it the natures of all , or their temperaments : Nor could the soul being but one, work upon so many



ny different temperaments, if they were not united into one temperament: Besides, we should be forced to run in infinitum, if we should hold more principles then one; for avoiding of which inconvenience, we must stay in one chief principle. If it be objected, that the nerves, veins and arteries are of different temperaments, therefore must proceed from different principles. I Answer, that from one principle in which divers temperaments are united, may issue different temperatures. 2. I denie that the temperature of the veins, nerves and arteries are different, otherwise then *Secundum magis, & minus*.

## CHAP. II.

*Blood begot in the Heart, not in the Liver, why?* 2. *The Heart is the original of the Veins and Nerves, of nutrition, and sense, and motion.* 3. *Why the nerves and veins do not beat, and the cause of Hydropsies.* 4. *All blood is not elaborated in the heart; how it is the original of the veins.* 5. *The arterial blood must waste, or else it would infinitely increase.* 6. *Why the blood thickneth not in the heart till death.* 7. *The heart is the seat of passion.* 8. *Why the heart a fitter seat for the soul then the liver.* 9. *A double unity, to wit, of the matter, and of the form.*

1. **I**F blood were begot in the liver, there should be some Cavity in it, that the blood there might be concocted, and receive its form; for in the stomach, Heart, Gall, bladder, &c. there are sensible cavities for generation and reception of the *Chylus*, vital blood, choler, urine, &c. but in the liver there is no such receptacle; and to say that the blood is begot in the substance of the liver, is to make penetration of bodies: Therefore it is more likely, according to Aristotle's Doctrine, That blood is begot in the heart. If it be objected, that if blood were not begot in the liver, to what end did Nature fasten the gall-bagg to the liver, if it were not to purge the blood, and receive its excrementitious choler, as the spleen doth its melancholy? I answer, The gall and spleen do not purge the blood made by the liver, but that matter which was to be prepared by the liver, for the heart; the heart then makes the blood, which was prepared by the liver, and purged by the gall and spleen, that the matter might be the fitter to receive the form of blood in the heart, being purged before from its gross humors.

II. Because the heart is the original of the nutritive and  
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active faculties; it must also be the original of the veins, through which these faculties are conveyed through the whole body. The liver then hath not so much heat as is requisite for nutrition, aucton, and generation; Therefore the original of these must be in the heart, which is the fountain of heat. 2. And because the heart is the seat of Passions, it must be also the original of sense and motion, without which there can be no passion; and consequently it must be the first organ of the nerves. 3. The heart and veins have the same essential form, which is nutritive or vitall; the same essential work and end also which is to nourish the body, or to give it life and vegetation. The like may be said of the nerves; therefore it must follow, that the matter of the heart, veins and nerves is the same; and that from the heart they have their beginning.

III. The *Galenists* will not have the heart the originall of the nerves and veins, because they do not beat, as the arteries do, which they grant proceeded from thence; but rather will have the liver to be the original of them, as also of blood, because when the liver is corrupted, sanguification fails, and so arises *Hydropsies*. I answer; though the nerves and veins arise from the heart, yet they beat not, as the arteries do, because the blood in the veins is grosser, less hot, and spirituous then that in the arteries; and the nerves beat not, because they have not those fumes which by the motion of the arteries must be expelled; their heat also is tempered by the frigidity of the brain; and if there were any motion in the nerves, it could not be so easily discerned, because of the thickness of the nerves, and their lying deeper within the body; as for *Hydropsies*, they are caused, not because the liver doth not sanguifie, but because it doth not prepare fit matter for the heart to sanguifie. And indeed, if the liver did sanguifie, the *Hydropick* would presently die upon the cessation of that action; for life cannot subsist without nutrition, nor this without sanguification. Therefore doubtless in *Hydropsies*, the heart being sound, converts some part of that inconcocted matter into blood, which the corrupted liver could not prepare; and by this means the *hydropick* lives a while.

IV. All the blood in the veins is not elaborated in the heart, but only that portion which is by the arteries distributed into all parts of the body; and hath a formative power over the veinal blood. The heart blood then is not conveyed by the (*Vena cava*) into the body; but by the arteries. 2. When the heart is called the



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the original of the veins, we do not mean, the efficient cause, for that is the formative power joyned to the heart; but the place in which they are formed: And there is no place so fit for this generation, both of blood, veins, and other parts, as the heart; because it is the fountain of heat, whose action is the first, and the most common of all actions in the body; for without the action of heat, there can be neither nutrition, motion, sensation, nor understanding, as it works by the phantasie.

V. If the arterial blood were not the nutriment of the body, and so wasted, being converted into the substance of the body, what becomes of it all, it must infinitely increase, being it is continually generated, and not wasted; neither can the veinal blood nourish, but as it is perfected, and receives its form, by and from the arterial blood.

VI. That the heart is the proper seat of the blood, appears by this, that the blood never thickneth in the heart, as it doth in other places, being out of the veins. But whereas the blood is found curdled in the heart of dead bodies, and thin in the veins of the liver, it is plain that the blood had received its full concoction and perfection in the heart, but not in the liver, as being not so fibrous, and therefore more thin and watrish.

VII. Because the heart is the seat of passions and appetite, it follows that it must be also the seat of sensation; for without this there can be no appetite in the sensitive creature; and if of sensation, then also of nutriment, for the sensitive includes the nutritive faculty; and if it be the original of the nutritive, it must be also of blood, by which we are nourished, and consequently of the veins which conveyeth the blood, chiefly of *Vena Cava*, which ariseth from the superficies of the heart; and so fastned to it, as to its principle, that it cannot be parted from it.

VIII. Because the heart is an organical body, being distinct into divers dissimular parts, it is a fitter place for the soul then the liver, which is altogether simular, seeing the soul is the act of an organical body: and therefore the nutritive faculty must be rather in the heart then the liver; and though sensation be by the simular parts, yet motion requires dissimular and organical parts, because divers bendings and turnings require divers organs.

IX. All sensitive creatures have a double unity; to wit, of the matter, and of the form: The unity of the matter consists



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sists in the unity of the parts and temperaments, which is to be found in the heart onely; the unity of the form consisteth in the sensitive soul, containing in it the vegetive and the particular forms of each part.

### CHAP. III.

1. Why the heart the original of sensation, and how it feeleth.
2. The brains being cold cannot beget sensitive spirits: Why the animal spirits most active where is most heat.
3. There can be no generation of the animal spirits out of the vitall, without the corruption of the vitall, which is impossible: The animal spirits are not begot of the aire.
4. Neither are they concocted or generated in the ventricles of the brain, nor are they wasted.
5. The brain is not the original of sense and motion, although these fail upon the hurt of the brain.
6. Why upon the distemper of the heart, there is no failing of sense and motion.
7. The nerves are not from the brain, though they be like; but indeed they are not like the brain.
8. Why the nerve of the heart loseth sense and motion beneath the knot, not above it.
9. The brain is the coldest of all the parts? how void of veins and blood, how hot, and the cause of hairs.
10. The blood and spirits alter not the brains temper. Why its coldness is not felt: the pith in the back bone hot.
11. Why the brain and heart at such a distance: by the spirits they work on each other.
12. Why both the brain and lungs were made for refrigeration.
13. The mans brain larger then the womans: why man hotter then Lions.
14. The testicles ignobler then the heart and brain.
15. The heart, not the testicles, the cause of sensation and generation; the testicles not chief because necessary, or because they cause an alteration in the body, from whence is the distinction of sexes.
16. The seed receiveth its specificall form from the heart.
17. Why Eunuchs fatter, weaker, and colder.

**T**Hough the organs of sense be in the brain, yet the original of sensation is the heart, because it is the original of the spirits, the chief causes of sensation, and without which the organs were no organs: But the frigidity of the brain is not the cause of sensation, nor of the sensitive spirits; it only tempers the heat of the heart and vital spirits, that they may become animal. Neither is softness and hardness any thing to sensation, seeing this is no material but a spiritual and perfective quality. Now the heart is sensitive, not by the animal spirits derived



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derived thither from the brain; for these spirits in the heart would quickly lose their temper, by reason the heat of the heart is a more active quality then the coldness of the brain; but it feeleth by its own spirits; whether we call them vital or animal, or both. For the spirits being turned from vital to animal, receive only an alteration, but not a substantial change. For that only is in the aliments, which is transubstantiate into our bodies.

II. The brain being cold and moist, useth to convert superfluous vapours into those humours which most resembleth it self in these qualities, to wit, into watrish Catharrs, and cold distillations: therefore it is likely that the brain can transform the vital spirits into other more excellent then themselves; especially seeing coldness is a quality hurtful to nature, which consisteth in heat and moisture, and hath no other use in our bodies, but to condensat and to temper the activity of our natural heat; therefore we finde the animal spirits most active and copious in those creatures that abound most in heat, as in Men, Lions, Birds, &c. and in young men more then in old men.

III. If there be a substantial mutation of the vital spirits into the animal, the generation of the one must be the corruption of the other; and so the vital spirits must die, that the animal may receive the essential form. But how can the animal spirits subsist without the vital? Or how can that be called an animal or sensitive creature, whose vital spirits are dead, seeing there can be no sense where there is no life, nor life where the vital spirits are dead? 2. The animal spirits are not generated of the aire, which we draw in by breathing; for there can be no generation without mixtion, nor mixtion but of divers bodies: Now the aire is but one simple body, which cannot make a perfect mixtion without the other elements. If it be objected, that the air is impure, and not simple, I answer, Though the aire be not pure, yet it is not a mixed body Physically and properly, but only by apposition, as Wheat and Barley may be said to be mixed when they are joyned together, which is no Physical mixtion, wherein the elements lose their forms.

IV. The animal spirits cannot be generated in the ventricles of the brain, because there the excrementitious flegme is concocted: Nor can they be said to receive concoction there, seeing what is concocted is thickned, but the animal spirits are attenuated: now the cold brain is not fit to attenuate. Again, see-



seeing there is continual use of the animal spirits, they must be continually generated; but if they be continually generated, and never wasted, where will there be room enough for them? And that they are not wasted is plain, because they are not consumed by nutrition, as not being fit to nourish; nor by sensation, seeing this is a spiritual and perfective not a material or destructive act. Nor lastly by transpiration; for nothing is exhaled but excrements. Lastly, how can the brain be without feeling, seeing it is full of sensitive spirits, by which all other parts of the body feel?

V. When the brain is hurt and distempered, there follows a defect in sensation and motion, which is not a sufficient reason to prove that the nerves, sense, and motion have their original from the brain; no more then that the brain should have its beginning from the stomach, or other nervous parts: for we know that the mouth of the stomach being hurt, the brain by consent is made ill affected by reason of the sympathy and union of the nervous parts: so motion is hindered upon the ill affection of the brain, because of the many nerves united to the brain and back-bone: the brain then is not the principal agent of sense and motion, but instrumental onely, in that by its frigidity it tempests the vital spirits, and so makes them apter for sense and motion: so upon the defect in the pen, follows the faults in writing; and yet not the pen, but the pen-man, is the chief agent in writing.

VI. The reason why upon the distemper of the heart, sensation and motion do not cease, as they do upon the distemper of the brain; because though the heart be distempered, yet it makes spirits, which spirits being refrigerate by the brain, and conveyed through the nerves, cause sensation and motion, which could not be if the brain were hurt, this being the immediate agent and instrument, without which the heart doth not operate in sensation.

VII. To conclude the nerves to have their originall from the brain, because of their similitude, is a weak argument: For 1. Many children are not like their parents from whom they have their originall, but like strangers many times, to whom they have no relation. 2. There is no similitude between the brain and nerves; for that is soft and moist, these hard and dry. 3. Nor is the nerve in its medullary part like the brain; for this is cold, the marrow is hot. 4. If the nerves are from the brain because their inward parts are soft and narrow, then the bones should be derived also from the brain



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brain, for they have much more marrow in them. 5. If the nerves are from the brain because they have two tunicles, as it hath; by the same reason let the Arteries also have their beginning from thence; for these also are double tunicked. 6. All nerves have not this medullary substance within them.

VIII. Though the heart hath but one little nerve, which being tied, looseth its sense beneath the knot, but above retains it; though this, I say, be so, yet from hence it cannot be proved, that the brain is the originall of the nerves, or of sensation; but rather the heart; for the upper part of the nerve is sensible, because it is joyned with other nerves, whereas the lower part is joyned to none. 2. The spirits in the upper part are tempered by the frigidity of the brain, whereas the lower part hath no refrigeration; and though the faculty or power of sense is from the heart, yet the act of sensation is not exercised without a temperate heat, or refrigeration. 3. I think this is rather a conjecture of the *Galenists*, then an experiment: for who did ever find this nerve in a living creature.

IX. *Aristotles* reasons for the coldnesse of the brain, are to me not improbable, or easie to be answered: for if the brain were hot, we should never sleep, seeing coldness causeth sleep. 2. There are more moist humors and flegme ingendred in the brain, then any where else. 3. There is not blood in the brains, as in other parts of the body; for it is the blood that warms the body. I say there are not veins incorporating themselves into the substance of the brain, and terminating there, as they do in the flesh and skin; which is the cause that every part of the flesh or skin being pricked, bleeds; so doth not the brain, whose substance is white and bloodless; therefore though there be veins in the brain, yet they are distinct from the substance of the brain, and not ending in them; neither is that heat which is in the brain, its own, but adventitious and externall, to wit, of the arteries and veins, as also of fumes and vapours: so then the brain is the coldest of all the parts of mans body, yea colder then the bones, because the bones are dry, the brain moist: but cold with moisture is greater effectively then with ficcity, so the water is colder then the earth. If it be objected that the brain is hot, because the head is more hairy then any other part of the body, and because the brain stands continually in need of ventilation by the nostrils, and transpiration by the seams of the skul; I answer, That hairs are ingendred by the adventitious heat of the brain, out of the excrementitious humors of the head, and fumes which ascend thither.



ther; and therefore the brain stands in need of ventilation, because of the many hot fumes and vapours continually ascending thither.

X. The blood and spirits which are in the brain, alter not its natural temperament which is cold, especially seeing the blood is sent thither for nutrition; but nourishment is to cherish the part nourished, being converted into its substance, and not to alter its temperament. Now the reason why we feel the moisture of the brain, but not its frigidity, is, because there is nothing to hinder the tact from discerning its moisture, being in a soft substance (for where the substance is hard, there the tact is hindered from feeling the moisture) though it be moist, as when we touch ice; but the tact is hindered from discerning the frigidity of the brain, because of the veins and arteries within it, containing warm blood and spirits; yet though the brain be cold, the pith in the back-bone which is joyned to the brain, is hot, because we finde no flegme about it, as about the brain; it is harder then the brain, therefore more apt to receive and to retain heat: it is begot of blood, which is hot; and it was fit that this warm pith should be joyned to the cold brain, for moderating the brains frigidity.

XI. The brain was made cold to temper and moderate the heat of the heart; but not to diminish or destroy it; and for the same cause the heart was made hot to temper, but not to destroy the brains frigidity: therefore nature hath placed them at a proportionable distance: for had they been nearer, their actions upon each other had been more violent. 2. Though the organs of the sense be in the brain, yet the original of sensation is not there, but in the heart: for the brain with its organs are helps and instruments, not the efficient causes of sensation. 3. The mutuall action of the heart and brain upon each other, is not done immediatly, but by the intercourse of the spirits.

XII. Though nature doth not make two members specifically different in the same body, for the same operation, therefore fishes want Lungs, because they have gills for refrigeration; yet she hath made both the brain and lungs too in our bodies, for the same end and work, namely, to refrigerate the heart; and yet in this she is not superfluous, because the heart stood in need of a double refrigeration, as being subject to a double heat; the one is natural, for tempering of this the brain was made, that so the animal spirits might be generated; the



the other is adventitious, caused by hot fumes: for clearing of these, and of cooling the heart, the lungs were made, and so were the arteries too. As for the two eyes, and two ears, and other double organs in our bodies, they are not specifically different.

XIII. As the male hath a hotter heart then the female, so he hath a larger brain for the most part, that there may be the more refrigeration. I say for the most part, because the works of nature admit divers times exceptions; so Lions, though hotter then men, yet have lesser brains then men; but that heat in the Lion is more terrestriall, and therefore needs lesser refrigeration then that which is more aerial; yet it may be supposed that man abounds more in heat then Lions, because he hath a strait body, which is caused by the abundance of hot blood and spirits in mans body more then in other creatures.

XIV. That the testicles are not of such absolute necessity as the heart, even in respect of generation, is plain, because many creatures, as plants and insects have the faculty and power of generation without testicles. 2. The heart and brain in dignity far exceed the testicles, because these do not communicate to all parts the power of generation, as the heart and brain doe impart life and sense. 3. Creatures that have lost the testicles, can live long without them, but no creature can live long without the heart and brain.

XV. In sensitive creatures that doth originally communicate the generative faculty, which imparts the sensitive, because this includes that; but it is the heart not the testicles, which imparts sensation, and consequently the heart not the testicles, causeth generation. If it be answered that the power of sensation is derived from the heart to the testicles, and consequently of generation; then we must know, that this very answer confirms the *Aristotelian* opinion, namely, that the heart not the testicles, is the original of the generative. 2. It is a weak argument to prove the principality of the testicles from their necessity, for every part of the body, though never so base, is necessary, and yet there is but one principal member. And as weak is it to argue the principality of the testicles from the change that is caused in the body upon the loss of them; for so there is upon the loss of any other member, and many times death it self. 3. The distinction of Sexes proceeds from the formative power, but this hath not its original residence in the testicles, but in the heart, as being the perfectest mem-  
ber



## MANS BODY discovered.

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ber, and chief receptacle of heat and blood, and spirits, by which the formative power operates.

XVI. The seed receives its specifical form and essence in the heart, not in the testicles, in which it receives indeed concoction, that it might be made fitter for generation: but concoction causeth only an alteration in the quality, not a mutation in the substance. So the fruit receiveth its maturity or ripeness immediatly from the bough on which it hangeth; but its generative power from the root alone; so that the testicles are but the hearts instruments, working by its heat, and concocting the seed that it may be the fitter for generation.

XVII. The bodies of Eunuchs are fatter, weaker, and colder then of other men, not because the testicles do corroborate the body, as the *Galenists* think, but because the seed wanting evacuation, is turned into fat, and many vapours or excrements, which with the seed are evacuated in other men, are retained in Eunuchs, which oppresse the natural heat, and consequently cause debility; and because of this coldness, Eunuchs are lesse hairy; for hairs are begot of hot fuliginous vapours.

*Finis Libri Primi.*



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## B O O K II.

**G A L E N** in some things maintained;  
in some things rejected, or reconciled  
to **A R I S T O T L E**.

## CAP. I.

1. *Mans Body fitted onely for mans Soul. Tritons are not men.*
2. *How Mans body is more excellent then all others.*
3. *How the Soul is most in the Brain and Heart.*
4. *A twofold heat in us.*
5. *What Creatures nourish most.*
6. *The Womans imagination cannot alter the form.*

I. **A** S G O D hath bestowed upon Man the most excellent Soul of all others; so hath he fitted him with a Body answerable to such a Soul, of which no other Body is capable; and if it were, yet for want of fit Organs, the Soul could not exercise her functions; as we see in that Fiction of *Apuleius*, whose soul being in the body of an Asse, could neither speak, nor write, nor doe any thing but what was proper to an Asse; yet I have read of *Tritons*, or Fishes having the face, lineaments, and shape of mans body; One was seen in the days of *Tiberius*, another in the time of *Augustus*, a third under *Nero*: *Pliny*, *Ælian*, *Theodor Gaza*, *Trapezuntius*, *Alexander ab Alexandro*, *Scaliger*, and divers others affirm the truth of this; yet these *Tritons* or *Nereides*, cannot be called, nor are they men, though they have the outward shape: for it is not the matter, nor outward lineaments, but the form that gives essence and denomination.

II. Mans body is of all others the most perfect and excellent; though he hath not wings like a bird to fly, nor can see as an Eagle, nor hear so quickly as a Fox, nor smell so as a Dog, nor taste so well as Poultry, nor hath so quick a Oysters and Spiders; yet his hands, speech, and reason,

doe



doe countervail all these : for celerity and reception his senses yeild to the beasts ; for variety and judgement they must yeild to him.

III. Though mans soul in respect of understanding and will, be inorganical, and therefore not properly resident in any particular member more then in another, yet accidentally, because the brain is the seat of the fantasie, from which the intellect receives its objects, and the heart the seat of the affections, subservient to the will ; the brain is the seat of the intellect, the heart of the will.

IV. There is in us a twofold heat, the one celestial, the other elementary : that preserves us, this destroys us : that concocts our food, and turns it into nutriment, this corrupts and putrifies it, and turns it into noxious humours and excrements, as we see in burning Fevers. It is not then every heat that chylieth or sanguifieth, or assimilateth, but this celestial heat : Neither is it the quantity, but the quality thereof, and affinity it hath with the things concocted : For there is more heat in a Lion, then in a Pigeon, and yet the Pigeon will concoct that which the Lion cannot ; yet this celestial heat is helped by the elementary heat if it be temperate, and by the crasis, temperament, or constitution, if it be sound.

V. Nothing by way of food can cherish our natural heat, and maintain our life, but what had life and heat it self ; and the more perfect life it had, the better it nourisheth, as having nearer affinity with us. Hence animals nourish more then vegetables, because the matter of their bodies and spirits, are more consonant to ours then of hearbs or fruits, which if they bee contrary to us in their nature and qualities, they destroy us, as poisonous hearbs do. Purgine medicaments are of a middle nature, as having some similitude with the humours of our bodies, which they attract ; as Agary with Flegme, Rubarb with Choler, &c. and some dissimilitude with our bodies, upon which they work by weakning them, especially if they have any de-latory quality.

VI. Though the woman in conception, or afterwards, can by the strength of imagination presse some note or mark upon the seed or Embryo : yet she cannot alter the sex or form as she pleaseth, because this is not the work of imagination, but of a diviner power, to wit, of the external formative agent ; for which cause a man cannot beget any other then a man, for that his seed is not capable of any other form, neither doth the formative agent work otherwise then as the seed is inclinable to.



# The hid Secrets of

## CAP. II.

I. The Stomach and Lungs not necessary for life. 2. How the limbs are moved: the spirits are bodies more required for motion then sensation: the spirits are light: how they are the souls instruments: how the Muscles move. 3. Seven properties of the brain. 4. Twelve properties of the eye. 5. Its substance varrieth. 6. Why but one sight. 7. The eye how an agent and patient. 8. Its two lights and its colours. Light gives the second act.

**T**Hough the Stomach and Lights be two noble parts of the body for those that are to live long; yet life can consist without them or their action: For 1. Some have lived without chilification and respiration: the meseraick veins can draw some portion of the clysters to the liver for sanguification, by which life can be preserved. 2. Divers creatures live all the Winter, as Swallows, Cuckows, Dormise, &c. without any chilification or action of the stomach. 3. Women that are hysterical, can live only by transpiration, without respiration at all. 4. The arteries can draw air to the heart, though there were no lungs at all, yet not with that conveniency, because the lungs temper and qualifie the frigidity of the air before it comes to the heart. 5. Fishes breath not at all, nor have they any lungs, yet they live.

II. In the motion of our bodies the limbs are moved by the muscles, these by the nerves, the nerves by the animal spirits, and these by the soul, which produceth neither sense nor motion in the body without these spirits: for if the nerve be cut or obstructed, or bound, motion ceaseth; which sheweth that the soul worketh by these spirits, and that in the nerve there is more then a bare faculty of sense and motion required to make it move and feel: for in the obstructed nerve there is the faculty still, but not the motion, because the spirits are intercepted, which have their original from the brain as well as the nerves, but their action from the soul. 2. These spirits are bodies, as appears by their generation, fatigue & dissipation: for when these spirits fail, motion ceaseth, and we grow weary. 3. In the nerve though one and the same animal spirit causeth both sense and motion; yet a greater vigour is required for motion then for sensation, because the perfection of this consists in reception only, but of that in action chiefly. Now more force is required for action then for passion. 4. In the animal spirits there is a light or splendour, because they are a very attenuated substance,



substance, warmed by a celestial heat: This light is perceived in the eye being shut, in the other senses it is not seen, because their organs are not transparent: Now the spirit of the eye is the same with that of the ear, &c. 5. The spirits are not properly the instruments of the soul, because the soul is the form which worketh immediatly upon its matter; and the spirits are parts of this matter, but they are called instruments, because they convey to the members the faculties of the soul. 6. Though the will moves the muscles in men, and the will moves according to knowledge and election; yet in infants the muscles are moved by a natural instinct, and so they are in beasts who have not election and reason.

III. Man hath a larger and more capacious brain then other creatures have; because the soul of man being endowed with more faculties, required a larger habitation. 2. The brain is void of sense and feeling, because it is the Judge of all the senses. Thus the eye which seeth all colours, hath no colour it self, nor the tongue and palat any taste, which judgeth of all tastes: experience sheweth, that the wounded brain being cut or pricked, feeleth not. 3. Though the brain feeleth not, yet it hath a natural faculty to expel things hurtful; so there are antipathies and sympathies in insensitive things. 4. The brain hath no animal motion, though it be the original of this motion; yet it hath a natural motion of *Systole* and *Diastole* for the generation of the spirits, and expulsion of noxious things. 5. The brain is cold and moist; cold naturally, but hot accidentally, by reason of the spirits and arteries in it: cold, otherwise the attenuated animal spirits in it would quickly wast and consume with heat; and with often study and cogitation, it would soon be inflamed, and so into phrenzies wee should bee apt to fall. 6. Though the brain be cold, and the heart hot, yet the animal spirits are more attenuated then the vital, because these are generated immediatly of the grosse blood, whereas the animal are begot of the vital spirits, and are refined by the arteries of the brain. 7. The brain is moist, 1. That it may the more easily receive impressions: 2. That it may the better resist inflammation: And 3. That the nerves may by its moisture bee the more pliable, which otherwise would be stiffe.

IV. The Eye is the most noble of all the senses: 1. Because its action is quickest, apprehending its object in an instant: 2. Though the object be never so far distant, it is perceived by the eye, as the stars are. 3. Because light, which is the object of the eye, is of all accidents the most noble. 4. The eye hath



## The hid Secrets of

more objects then any other sense ; for besides light and colour of all sorts, its particular objects, it hath also number, magnitude, state, motion and figure, which are common objects. 5. None of the senses hath such a curious fabrick : for the eye hath six tunicles, three humours, six muscles, two nerves, the optick and motory, many veins and arteries. 6. It is the first and chief organ of knowledge ; for at first men got their knowledge by observation and the eye, though now we have it by instruction and the ear. 7. The eye hath the highest place of all the senses in the body. 8. And it hath the perfectest figure, for it is almost round, that it may move the easier and swifter. 9. It hath a liberty and command of it self which the other senses have not ; for it can inclose it self within its casements, and open them when it pleaseth. 10. It hath a peculiar light within it self, besides that light which is in the air, and it hath more spirits then any other of the senses, and these spirits are more subtle, nimble, and quick then any other animal spirits are. 11. Without the eye no living creature could finde out its food, in which consisteth the life of the creature. 12. Without the eye men could not have naturally attained to the knowledge of God, and of Divinity ; for by the contemplation of the Heavens, and their light and motions, men came to have the knowledge of their Maker : For the invisible things of him from the creation of the world, are clearly seen, being understood by the things that are made, *Rom. 1. 20.*

V. The eye is of a watrish not of a fiery substance, as may bee seen, 1. By the water that flowes from it when it is hurt : 2. By the fat which is about it ; this would consume if the eye were fiery : 3. By the watrish humour which is in the cavities of the face in the new formed Embryo : 4. By the reception and conservation of the species ; for the fire can neither receive nor confer any image or species, as the water doth.

VI. Though there be two eyes, there is but one sight, or one object seen ; 1. Because the optick nerves are united in one before they reach to the eyes : 2. Because there is but one fantasie, and one common sens which judgeth of the external object.

VII. The eye in respect of its grosse and solid parts, is a patient in seeing, by receiving the species or shape, (not the substance) into the chrystalline humor ; but in respect of the spirits in the eye, it is an agent by perception of the species, and partly a patient : for there is some impression in the spirits, or else by them the species could not be conveyed into the common sense and phantasie : The spirits then are agents, not outwardly



wardly upon the object, but inwardly upon the spirits received from the object: and when they are employed about som other thing in the phantasie, the eye seeth not its object, though the species be impressed in the chrySTALLINE; because there is required for sight, not only the impression in the chrySTALLINE, but also a perception and apprehension in the spirits; in which action properly and formally vision consisteth. And though the spirits be no part of the eye as it is a solid substance, yet they are part as the eye is the instrument of sight.

VII I. There are in the eye when it seeth, two lights, the one from without, whereof there is greatest quantity in the white of the eye; the other from within, which is most prevalent in the chrySTALLINE, disposing it to receive the species, as the outward light disposeth the air. The outward light, if it bee not proportionable to the inward, makes this unfit for vision, not by extinguishing, or destroying it, for one light cannot destroy another; but by too much extending or destroying the mean and proportion of the inward light. There is besides these two, a third light in the eies of owls, cats, & such creatures as live by preying in the dark, which light is not immanent in the eye, but transient into the air, that the medium being illuminate, the species of the object might be raised.

IX. The eye hath not such colours as are made by the mixture of the four elements, or prime qualities, but such only as are made by the mixture of the light and the diaphanous or perspicuous body. The first sort of colours are in the dark in respect of their existence or quality: the second sort hath no existence at all in the dark: And though the light give not the first act or being to colours, yet it giveth the second act in making them visible, and actuating them, to work upon the eye, by sending their species thither.

### CAP. III.

1. A twofold Heat in living things.
2. The Primitive Heat where, and how tempered.
3. Our spirits are not celestial, several Reasons.
4. Our natural heat, what? it is no substance, in six Reasons.
5. Many excellencies of mans body.
6. The Head, why the noblest part, and highest, as Galen thinks.

**T**HAT there is in living creatures besides the elementary heat, another called celestial, is manifest, because the fire or elementary heat, neither in part, nor in whole, is the cause



of generation. 2. Because the elementary heat remains after the celestial is gone, as may be seen in spices, which retain or rather increase their elementary heat, as they grow drier, being separate from the Tree; and yet they want that celestial heat by which they did live and had vegetation; for now being dead, nutrition, attraction, vegetation, growth, and other functions of life cease, which were the effects of the celestial heat. 3. Because in Mandrakes and other cold herbs, there is this celestial heat, by which they live; and yet no elementary heat at all; for they are cold both actually and virtually.

II. As in living creatures there be divers dissimilar parts, so there be temperaments, and diversity of heat; all which are united in the heart, the fountain of heat, which it communicates to all parts by the blood and spirits; this primitive heat is in perfect creatures compacted within the heart; in Trees and Plants, within the root; in Insects it is diffus'd through all the body, without any union in one part more than another; which is the cause that when snakes and worms are cut in pieces, every piece moves, which is not so in the hand or foot of perfect animals if they be cut off; so we see in some twigs of Trees, that being set in the ground, grow and take root; which shews, That the original heat and substance of the root, is in every part of the Tree; and that the primitive heat of the creature might be brought to a temper, refrigeration is required, which in terrestrial animals is performed by the air, in fishes by the water, in herbs by the earth moistned, by which they are nourished and refreshed.

III. The animal and vital spirits in our bodies are not a celestial substance, as some have thought. For 1. The Heavens are not subject to generation and corruption as these are. 2. The Heavens are a quintessence, but these are elementary or aerial. 3. The Heavens cannot be diminished, which they must needs be if our spirits be heavenly bodies; for they are as they say, pieces of that great body, which at last will be quite spent, except they be repaired either by a new addition, or by the reuniting of the same spirits to it again. 4. Seeing the Heavens have but one motion which is circular; how can any part thereof come down into our bodies, except it hath also a strait motion? 5. Gravity and levity are elementary qualities, whereof the Heaven is not capable; and therefore cannot descend. 6. Our spirits must either be united to the bodies of the Heavens, and so continued bodies with them, or else separated and divided; both which are absurdities. 7. These spirits did either move them-



selves downward, or else they had some other mover; the first we cannot grant, except we make the celestial bodies, living creatures, for only such move themselves; neither can we grant the second, except we know what this mover should be; it cannot be natural, for the motion is violent; nor can the mover be violent, for the work of generation is natural; it remains then that these spirits are aerial in their nature and substance, but the instruments of the soul in regard of their function, in which regard only we consider them as they are in our bodies; for many actions proceed from them, as they are the souls instruments, which cannot be effected by the air, as air.

IV. The natural or primogenial heat in living creatures, is not a substance made up of seed and menstruous blood, as *Galen* thought: For, 1. In Trees and Herbs there is this naturall heat, yet no menstruous blood; in insects begot of putrified matter, there is this heat, but neither seed nor the foresaid blood. 2. This heat must diffuse it self through all the least parts of the body, without which they cannot live; but if it be a body, there must be penetration of bodies; if there bee this diffusion; if there be only an agglutination of this heat to the parts of the body, then these parts have not life in themselves, and consequently neither nutrition, or attraction which are the effects of life, and by which it is preserved, and so the Fibres which are given for attraction are in these parts in vain. 3. If this body of our natural heat did live before it was articulated and distinguished into members, then the heart is not the first thing that liveth; besides it will follow, that the soul may be the act of an inorganical body, which is against the definition of the soul. 4. Nor can the blood in the veins be this body, because this blood is the effect of concoction and nutrition, and it is blood only: but that body of *Galens*. is the effect of generation, and the mixrure of seed and blood. 5. If this natural heat hath no life in it, then it will follow that the chief part of the living creature is without life. 6. This heat then is a quality, in children more vigorous and intense then in men, because its work in these is only to concoct and nourish; but in those to extend the body also, which is a greater work, and therefore requires more heat. Besides, children cannot endure hunger so well as men, because their heat being greater wastes the bodie sooner, where it hath not food to work upon: children then are more hot intensively, but men extensively, because their bodies are larger, according to the dimension of which, their heat is diffused. And although they



they can eat harder and more solid meats then children, it argues not that their heat is greater then that of childrens, but that their instruments of mastication (which is the first concoction) are better and stronger.

V. That mans body might be a fit habitation for the Soul, it was made of all bodies the most 1 temperate, and 2 proportionable, 3 the most copious of organs, so that it may well be called a Microcosm, containing as in an epitome, the parts of the great world. 4. It was also made naked, as needing no other arms or defence, then what man was by his reason, tongue and hands, able to furnish himself with. 5. It was made not of an heavenly, but of an elementary substance, because man was made for knowledge, this is got by the senses; these are grounded on the proportion of the 4 prime qualities, of which the Heavens are not capable. 7. It was made strait that 1 man may be put in minde of his original that he came from heaven in respect of his soul! 2 That he might affect and seek after the things above, not here below. 3. He abounds more in spirits and heat then other creatures, and the heat and spirits raise the body upwards towards their own proper place. 4. If man had not been of a strait body, his hands which were made for many excellent uses, must have been hindered, and employed with the feet, for motion and supporting of his body. 6. Hee was made with long feet, that his body might be the more steddy and strongly supported: with feet forward, because all his actions and motions tend that way. 7. He was not made with wings to fly, because he had hands to make him fly on the water in ships; and he had knowledg to make him fly to Heaven in contemplation; with the wings of Faith we can fly swifter & farther, then *David* could have don with the wings of a Dove.

VI. Mans head is of all parts in the body the noblest, therefore it is placed in the highest Region, and nearest Heaven, which it resembleth both in figure and use; it is almost round, 1. That it may be the more capacious of spirits and of brain, of which is more in man then in any other creature, because in him is more variety, and perfection of animal spirits then in other creatures. 2. That it may bee the fitter for motion. 3. That it might be the stronger and more able to resist injuries. Again for use: It is like Heaven, for this is the seat of the Angels or Intelligences, and that is the seat of the Intellect; so far forth, as it is the seat of the phantasie by which the intellect worketh, and of the senses by which the phantasie is informed. And as all sublunary bodies receive life,  
sense,



sense, or motion from the Heavens, so do all our members from the Head; so that if our brain be wounded, sense and motion in the body presently cease. The head is that by which man is Lord over the beasts, therefore deserved to have the highest place in the body: it is the Citadel of this little world, in the safety of which consisteth the safety of the body; therefore hands, feet, arms, and all, are ready to protect the head when it is in danger. Hence anciently the head and brains were honored above the other members: they used to swear by the head, [*per caput hoc juro, per quod pater ante solebat.*] When any sneezed, they were wont to bless them with a prayer, because the brain is affected in sneezing. Men use to uncover their heads to their superiours, intimating that they discover and present to their service the noblest part of their bodies; and for honours sake the Priest abstained from eating of the brains.

CAP. IV.

I. What the spirits are. 2. They differ in seven things. 3. The Woman is only passive in generation: Her Testicles, Arteries, &c. not spermatical parts; the males seed evaporates, why the child resembles the parents; the blood may be called seed. 4. Adeps how generated. Of the Lungs, they are hot.

THE Animal and Vital Spirits are so called, not only because we have sense and life by them, but also because they first have life and animation in themselves; for otherwise how could the soul give life and sense to the body by these which are not (as some think) capable of either. 2. These spirits are parts of our bodies, parts, I say, not solid and containing, but fluxil and contained. 3. They are one with the vessels & members, to which they do adhere; one, not specifically, but quantitatively; so the gristle is one with the bone that ends in the gristle. 4. These spirits are not the same with the vapours that are in our bodies: For the vapours are excrements, and hurtful to us, therefore nature strives to expel them; but the spirits are parts, & helpful to us, therefore nature labors to retain them. 5. These spirits sometimes are extinguished by violence, sometimes are wasted for defect of food and maintenance; he that is drowned hath his spirits extinguished, he that dieth of sickness, hath his spirits wasted. Thus the flame in the candle by the wind is extinguished, by the defect of wax it is wasted: the quantity remains in that, it is lost in this.

II. The Animal, Vital, and Natural spirits are distinct in their originals;



originals; for the animals are from the brain, the vital from the heart, the natural from the liver. 2. In their Vessels; for the animal are in the nerves, the vital in the arteries, the natural in the veins. 3. In their operations; from the animal we have sense and motion; from the vital, life; from the natural aucton and nutrition. 4. The vital spirits remain when the animal and natural are gone. In a Palsie there is neither sense nor motion; in an Atrophy there is neither aucton nor nutrition; and consequently, neither animal, nor natural spirits, and yet there is life and vital spirits. 5. The Natural spirits are in every part of the body, so are not the Animal and Vital, but in their proper vessels. 6. The motion of the Animal spirits is voluntary, and in our power, so is not the motion of the other spirits. 7. The Animal spirits rest in sleep, the Vital and Natural are then most active. 8. The Animal spirits are subject to fatigation and cessation, the others not. 9. In Vegetables there are Natural and Vital spirits, but not Animal; in imperfect Animals there are all three, but grosser and colder, therefore not so apt to be dissipated.

III. That there is no active seed in the female for generation, but that she is meerly passive, in furnishing only the Matter or Menstruous blood with the place of conception, is according to *Aristotle* manifest; because if the females seed were active, she may conceive of her self without the help of the male, seeing she hath an active and a passive principle, to wit, seed and blood; and where these principles are, there will be action and passion. If the *Galenists* object, that the females seed is colder then the males, and therefore not procreative without it; I answer, That though it be colder then the males, yet it is hotter then the blood, and therefore active, the blood being meerly passive. Again, the heat of the males seed is but an accident, no ways concurring essentially to generation, but only by way of fomenting and cherishing the females seed, as the heat of the Hen doth to the generation or production of the Partridge; whereas the whole power and faculty of generation, was in the Egg, not in the Hen: & so by this opinion, the males seed affords nothing but heat or fomentation. 2. If the females seed be active, and the males too, it will follow, that two efficient numerically different, and having no subordination to each other, do produce one effect, which is absurd. 3. It will follow, that there are three material causes, to wit, the males seed, the females, and the blood, and therefore must be three forms; for one form hath but one matter. 4. It will follow, that the female



is perfecter then the male, as having more principles of generation, to wit, the seed, the blood, and the place or matrix. 5. And in this respect, that the male will stand more in need of the female, then she of him, he being more indigent of these principles of generation then she, and having a greater desire to perpetrate the species then she. 6. The *Galenists* are mistaken, in thinking those glandulous substances in the female to be testicles containing seed, whereas they are kernels to receive the superfluous moisture of the matrix. 7. The arteries, nerves, and veins, are not spermatical parts; for of the seed no parts are procreated, but they are sanguineal, as the flesh differing from the flesh in this, that being cut, they do not unite again, as the flesh, because of their hardnesse and drinesse, and want of that moisture which is in the flesh. 8. The males seed being received into the menstruous blood, doth evaporate and turn into spirits, animating the informed masse. 9. The child sometimes resembleth the Father, sometimes the Mother, according to the predominancy of the seed or the blood. 10. As the blood nourisheth the nerves, veins, &c. so it may be transformed into them. 11. The blood may be called seed, because the seed is begot of it; and as in Vegetables, Hearbs and Trees are begot of seed, so in animals, procreation is of the blood. Hence Christ is called the Seed of the Woman.

IV. The *Adeps* or fat in our bodies is generated, not by heat, for heat dissolves and melts it. 2. Coldest temperaments are fattest, as Women are fatter commonly then men, in Winter, creatures are fatter then in Summer, in cold more then in hot Climats men are fatter; *English* and *Dutch* are fatter then *Italians* or *Spaniards*. 3. Fat adheres only to the colder parts, as the membranes: Nor is it generated by cold; For, 1. No part of our body is actually cold, but hot. 2. The Kidneys and heart, which are very hot, have fat adhering to them. 3. Melancholy men, and old men, who are cold, have little or no fat. It remains then, that the *Adeps* is begot of a temperate heat, which in respect of a greater heat may be called cold; as the brain in respect of the heart. And nature hath placed the fat next to the cold membranous parts, for cherishing of them; so the fat of the Cawle was chiefly ordained for fomenting of the stomach, which is oftentimes wasted by the excessive heat of the liver. Hence it is, that a hot liver is accompanied with a cold stomach: for the hot liver like a cupping glasse, sucks and draws the heat of the neighbouring parts to it.

V. When



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V. When we consider the cold flegm with which the lungs are still infested. 2. The office of them, which is to refrigerate the heart. 3. Their colour, which is whitish; we would think that they were of a cold constitution. On the other side, when we 1. look upon their light and spongy substance; 2. on their office, which is to temper and warm the cold air, that it may not offend the heart: 3. On their nutriment, which is the cholerick or bilious blood; we would think they were hot of constitution; and indeed so they are, and cold only by accident, by reason of the external air, and water from the brain, and other parts.

### CAP. V.

1. *The prerogative of the heart.* 2. *The actions of our members.* 3. *There are no spermatical parts.* 4. *The bones, nerves, veins, &c. why not easily reunited.* 5. *The spermatical parts hotter then the sanguineal.* 6. *The brains and scull, bones and teeth compared.*

**T**HE Heart hath divers prerogatives above other members: 1. It is the Fountain of our natural heat. 2. Of the Vital spirits, from whence the Animal have their Original. 3. It is placed in the midst of the breast. 4. It is the first that lives, and the last that dies. 5. It is of that absolute necessity, that the welfare of the sensitive creature depends on it; therefore Nature preserves it longest from diseases, and as soon as the heart is ill-affected, the body droopeth. 6. Sensitive creatures can live, some without Lungs, some without a Spleen, some without Kidneys, some without a Gall, some without a Bladder, but none can live without the Heart, or something answering to the Heart, as bloudless animals. 7. The Heart is admirable in its motions, if either we consider the manner or perpetuity thereof, or that it is of it self not depending upon our will or pleasure.

II. The actions of our members, depend originally from the temperament of the simular parts; but in respect of perfection and consummation, from the conformity and right situation of the Organ, so the temperament of the Chrystalline humor is the efficient cause of sight; but the situation and conformity of the parts of the eye, is the perfecting or consummating cause: For if the Chrystalline, or other parts of the eye,

were



were otherwise situated, we should either not see so well, or not at all.

III. That there are no spermatical parts, as Nerves, Bones, Veins, &c. but sanguineal only, is plain by these reasons, 1. To make more material causes than one, is to multiply entities needlessly, whereas the menstruous blood is sufficient matter for all the parts; which because it is the matter of our bodies, it had an inclination, disposition, or potentiality to all parts: and because the work to be produced, was Heterogenious, and the form heterogenious, therefore the matter had an heterogenious potentiality, as well to those parts which the Physicians call spermatical, as to the sanguineal. 2. I would know which be the spermatical parts of an Egge: not the white; for of that they grant the whole Chick is formed: not the yelk; for that is, they say, the food of the Chick, and yet we see the Chick hath bones, and other spermatical parts, as they call them. If then Bones and Nerves are no seminall parts in a Chick, neither are they in a Childe, the reason being alike in both. 3. The spermatical parts are nourished by the blood, then doubtless they were generated of blood: for [*isidem nutritur ex quibus constamus*] and there can be no nourishment without transiition and transmutation of the blood into the parts nourished. Now to say, that the blood which nourisheth these parts, becomes seed, or spermatical, is to employ the testicles in continual working of seed for nutrition of the spermatical parts: how can so much seed be generated, and by what vessels shall they be carried to the upper parts of the body. 4. The heart and liver are sanguineal parts: then doubtless the nerves, arteries, and veins which are from them, bee sanguineal.

IV. The Bones, Nerves, Arteries, Veins and Grisles being cut or broke, are not so easily re-united as the fleshy parts: not because they are spermatical, but because they are harder and drier then the fleshy: for in children, while they are soft and moist, they are easily reunited; and the Veins which are softer then the Arteries, are sooner healed: for the hardness, thicknes, and perpetual motion of the Arteries, hinder its coalition. 2. Likewise where there is defect of natural heat, as in old men, these are hardly knit together: For heat is the chief Artificer or Agent in the body. 3. And where there is defect of matter, or radicall moisture, the cure is difficult, as in old men. 4. If there be not a sufficient time given, the cure will never be effected: Thus the heart being wounded,



ded, is never united, because life flieth before the cure can be performed.

V. The spermatical parts by most are counted colder then the sanguineal; which cannot be: for we find by experience, that there is more heat in the stomach, then in the liver; for it is a greater heat that turns bones, or such hard meats into a liquid substance, then this which turns our liquid substance into another: to wit, the Chylus into blood: If it be objected, that those creatures, whose stomachs are incompassed with flesh concoct best: I answer, it is true, not because the flesh is hotter then the stomach, but because it keeps in the heat: thus though our cloaths keep in our heat, no man will say, that they are hotter then we; for this cause our bones and nerves are wrapped about with flesh, and yet these are hotter then the flesh, in their opinion that call them spermatical; for they confess, that the seed is hotter then the blood, therefore that which is generated of seed must needs be hotter, then that which is begot of blood. If it be objected, that the seed is hot in respect of its spirits, but cold in respect of its matter: I answer, that if the matter of the seed were not hot, it could not so much abound in spirits, for by the heat the spirits are begot, and not heat by the spirits: therefore when the heat fails, the spirits fail: Hence it is, that the animal spirits in the nerves move not the hand, when it is benumbed with cold: but let the hand be warmed, and then the spirits have life again.

2. Those parts which they call spermatical, are more sensible of the cold, and sooner offended by it then the sanguineal parts, and therefore must needs be hotter: for one contrary is most sensible of another: thus are we more sensible of a little cold in Summer, when we are hot, then of a great deal in Winter; Southern people, whose bloods are hot, are sooner offended with cold, then the Northern, whose constitution is colder.

3. The heat of the bladder, which they call a spermatical part, is so great, that it can bake the slimy substance of the urine into a hard stone, which argues its heat above the sanguineal parts. Some Physicians answer, that this is done, not because of the heat, but by reason of the long stay, and sliminess of the matter: but they must know, that the slimy matter is meerly passive, and that it is the heat which is the agent, and artificer of the stone: as for the long stay, that is but a help, for time is no agent.

4. That the bones are hot, is manifest, for they have much fat in them, as we see in bones when they are burned, and a greater heat was required to bring them



## M A N S B O D Y *discovered.*

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them to that hardness, then the ordinary heat of the sanguineal parts.

V I. The brain was not made for the skul, but the skul for the brain, therefore it is like they were formed both together, and that the skul was proportioned to the bigness of the brain, and not this to the bigness of the skull. 2. The brain and skull were placed uppermost, for the eyes, which were to be neer the brain, because of the spirits: and optick nerves, which by reason of their softness, were fittest to be implanted in the eye, otherwise they had been too hard; for the nerve is harder, as it is farther from the brain: and no place was so fit for the eyes, which were to watch over the body, as the upper place; neither could the eyes be so secure any where, as within these concavities of the skull. 3. The skull being a bone, feeleth not, for bones have no other sense, but what is in the membrans or *Periostium*; neither can there be sense, but where there be nerves, but there be none in the bones: except in the teeth, which therefore feel, because the nerves are incorporated in them, and communicate the sensitive spirits to all parts of them, and the sensitive faculty with them: yet they are more sensible of the first, then of the second qualities. 4. The teeth are still growing, because there is continual need of them, and are harder then other bones, because they were made to bruise hard meats. 5. They are more sensible and sooner offended with cold then with heat; and yet heat is the more active quality, which sheweth, that the constitution of the teeth is hot, for if they were cold, they should not bee so soon troubled with cold, being a friendly quality.

### CAP. VI.

1. Two sorts of blood; the heart first liveth, and is nourished, and the original of blood, not the liver. 2. The hearts action on Vena cava; the cause of sanguification. 3. Blood caused by the heart. 4. How every part draws. 5. Heart the first principle of the nerves. 6. Nerves, how instruments of sense and motion. 7. The same nerves serve for sense and motion.

1. **THERE** are in our bodies two sorts of blood, the one arterial, begot in the heart, for the exciting of our heat; the other venal, begot in the liver, for nourishing of the body: so according to Aristotle, the heart; and according to Galen, the



the liver may be called the fountain of blood. 2. As the heart is the first thing that liveth in us, so it must needs be first nourished, for life cannot be without nutriment, & nutriment cannot be without blood, therefore there must needs be blood in the heart before there was any in the liver. 3. As the heart first liveth, so it first operates, for life consists in operation: but the proper work of the heart is to beget arterial blood and vital spirits, therefore the blood was first in the heart. 4. Though blood resemble the liver in colour, it will not therefore follow that blood hath its first original from the liver, but only that it is the receptacle and cysterne of blood; so the bag, in which the gall lieth, hath the same colour with the gall, and yet this is generated in the liver, and onely contained in the bag; and its a question, whether the liver coloureth the blood, or the blood the liver. 5. In fear and sadness, the blood retires into the heart, which is by means of the spirits recoiling thither with the blood, as to their original. 6. In the brain we finde four sensible concavities for the animall spirits; in the heart two, for the blood and vital spirits; but in the liver none, for the blood; in the testicles none, for the seed; nor in the breast for the milk; which makes me doubt, whether the blood, seed, and milk, have any concoction in these parts, if they have, it must be surely in a very small quantity. 7. I finde pure blood no where but in the heart and veins; by which I gather that there must be a greater commerce between the heart and veins, then some doe conceive, which appears also by the implantation of the *vena cava* in the heart, which cannot be separated without tearing of the heart or vein; and that either the blood is perfected in the heart, and prepared in the liver, or else prepared in the heart, and perfected in the liver: besides, that the arteries doe all along accompany the veins.

II. I see no reason why we may not affirm, that the heart is continually in its *Diafole*, drawing blood out of the *vena cava*; and in its *Systole* or contraction, refunding blood into the same vein: for this continual motion of the blood, is no more impossible then the continual motion of the heart and arteries; neither is it more absurd for perfect and imperfect blood to be mingled in this motion, then for cholerick, melancholick and flegmarick blood, to be mingled with pure blood in the veins. 2. When the liver is vitiated, sanguification faileth, and so hydropies follow, which doth not prove that the liver is the sole cause of sanguification, but that it is subordinate to the heart: so when the ChrySTALLINE humour is vitiated, the sight faileth,



faileth, and yet this humour is not the sole cause of sight, but is subordinate to the optick nerve and spirits. The heart then by the liver distributes blood to the members. 3. The veins have their radication in the liver, their office and distribution from the liver and the heart: their original from neither, in respect of matter, but in respect of efficiency from the heart; for this first liveth, and therefore the fittest place for the formative faculty to reside in.

III. The *Chylus* is turned into blood, not by the substance of the Liver, for the *Chylus* comes not neer it, and there can be no alteration or concoction without contact: nor by the veins, for their office is to convey and distribute the blood, not to make it. So the arteries doe not make the arterial blood, which they convey: besides that the form, temperament, and colour of the blood is far different from that of the veins; therefore the blood is made by the power of that celestial heat by which we receive life, growth, and nutriment: for the same heat produceth divers effects in the divers subjects it works upon; in the stomach it turns our meat into a white *Chylus*; in the veins into red blood: in the feminal vessels into seed, in the breasts into milk, &c.

IV. The same Meseraick veins which draw the purest part of the *Chylus* from the intestins, that it might there receive sanguification, contain also pure blood, which the intestines draw for their nutriment, for every part draws that food which it most delights in. Thus from the same mass of blood, the Spleen draws melancholy, the gall choler, the kidneys, water.

V. The *Peripateticks* will have the heart to be the first original of the nerves, and of the sensitive motion: The *Galenists* will have the brain; but this contention is needless: For the heart is the first principle, because it is the first that lives and moves, whereas the brain moves not but by the heart. In a Syncope, or swooning fit of the heart, all sense and motion suddenly fail, which could not be if these had not their original from the heart: the brain may be called the secondary or subordinate cause or principle: for this by its cold, tempers the vital spirits, and so they become sensitive or animal. Hence it is that in an Apoplexy there is a sudden failing of sense and motion. If any say, that the body can move after the heart is taken out, and that therefore the heart cannot be the first principle of motion: I answer, so can the body move after the head is off, as wee see in Poultry. This motion then excludes neither the head nor heart from being originals: for



it is caused by the remainder of the spirits, which are left in the nerves and arteries. As for the Apoplexy, I take it to be an affection, not of the brains alone, but of the nerves also.

V I. The common opinion is, that the nerves are the instruments of sense and motion: and yet we see sense and motion where there are no nerves: for in every part of the body there are not nerves, and yet every part feels and moves: this sense and motion must needs proceed from the spirits in the blood, which is in every part of the flesh and skin, where there are no veins. If it be replied, that upon the obstruction, or binding of the nerve, sense and motion fail: I answer, the like failing there is of sense and motion, when the arteries called *Carotides*, are bound up; for as the animal spirits will not work without the vital, neither will the spirits in the blood and flesh work, if they fail which are in the nerves, such is the union amongst them, that this failing, all action ceaseth.

V II. Seeing the sensitive and motive Spirits differ not specifically, there is no need why wee should assign different nerves to sense and motion; for the same nerve serves to both; it is true, that there be some hard, some soft nerves, because some have their original from the soft brain, and some from the harder pith of the back bone; and that the soft nerve is fittest for sense, which consisteth in reception, for soft things are aptest to receive impressions; as the hard nerve is fittest for motion which consisteth in action; therefore the same nerve conveyeth sense to all parts capable of sense, and motion to the parts apt to be moved: Hence the nerves inserted in the muscles, move them; but the nerves inserted into the mouth of the stomach, moves it not, because the stomach hath no muscles, yet it communicates to it, an exquisite sense.

CHAP.



CHAP. VII.

1. How the spirits pass through the nerves: their swift and various motions, even in sleep: motion and sense not still together.
2. Sense and motion in phrenies, epilepsies, leprosies, caros.
3. Muscles, how, when and where the causes of voluntary motion.
4. How the fibres and tendons move the muscles.
5. The muscles of the tongue, abdomen, diaphragma, ribs, bladder.
6. The organs of taste, its medium.

I. **A**LTHOUGH the nerves are not sensibly pervious as the Veines and Arteries are, which were purposely made hollow for the passage of the venal and arterial blood; yet the animall spirits being subtil and sublimated bodies can freely passe through the soft and spungy substance thereof, as well as sweat through the pores of the skin. 2. Though in the Palsie the animal spirits cannot passe through the thick, clammy and glassy flegme, which by reason of its coldnesse, deadens the spirits, which without the natural heat, have no vigour or motion, yet they can freely passe through the nerves by help of the native heat. 3. Though the spirits by reason of their specifical form or aerial nature should only move upward, yet as they are instruments of the soul, they move which way the soul will have them move. 4. Though no grosse body can move in an instant, yet their spirits can, being moved by the soul immediatly, and being such sublimate and subtil bodies, that they come neer to the nature of spirits. 5. Though in sleep the senses are tied up, yet there is oftentimes motion; as we see in those that walk and talk in their sleep, and yet feel not; because the fore ventricles of the brain are affected, in which is the common sense, so is not the pith in the back, from which the most of the motory nerves have their original. 6. In one and the same nerve oftentimes motion faileth, and the sense remaineth, because more spirits are required, and greater force for motion being an action, then for sense, which consisteth in reception or passion. 7. Sense doth sometimes fail, the motion remaining sound; when the nervous branches which are inserted into the skin, are hurt or ill-affected, at the same time the nerves inserted into the muscles may be sound.

II. In phrenies the motion is strong, but the sense weak; because the braines being inflamed, the nerves are heated



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and dried, therefore fitter for motion, but the lesse apt for sense, which requireth a soft nerve. 2. In the falling sickness sense faileth, but not motion, because the fore ventricles of the brain being ill-affected, the common sense is intercepted; but the pith of the back bone from whence the most nerves are derived, is not hurt, therefore motion not hindred. 3. In leprosy the sense is dulled, but not the motion, because the nerves and skin are dried, by which sense is hindred, but not motion. 4. In a deep sleep or Caros, there is respiration without sense, because the fore-part of the brain is hurt, but not the nerves and muscles of the breast. 5. Oftentimes the eye loseth its sight, but not its motion, because the optick nerve by which we see, is not the same with the nerves, by which the eye is moved.

III. All spontaneous motions are caused by the spirits in the brains, nerves and muscles in the creatures that have them, but where these organs are not, the animal spirits move the body without them, as we see in worms. 2. All muscles are not the organs of voluntary motion: for the three little muscles within the ears move them not to hear when we please, for many times wee hear what wee would not. 3. In those parts where there be nerves without muscles, there is no voluntary motion, because the nerves convey only the spirits, which the muscles receive, and by them immediately move the body. 4. Respiration in sleep is a natural, not a voluntary motion, caused notwithstanding by the muscles of the breast. 5. Sleep-walkers are moved by the muscles, which motion then cannot be voluntary, for the walker hath not knowledge of his walking, or of the end thereof. 6. Beasts are moved by their muscles, which motion in them cannot be called voluntary, but spontaneous onely.

IV. All muscles have not tendones, but such as are appointed for a strong and continual motion: hence the muscles of the tongue, bladder, and *anus*, have no tendones. 2. The muscle is moved not onely by the nerves and tendones, but also by the fibres within its own fleshy substance: and indeed the fibrous flesh is the chief instrument of spontaneous motion; and where they are wanting, there is no such motion: Hence it is that beasts can move their skins, which men cannot, because beasts skins adhere close to a fibrous substance, whereas that of mans is nervous; onely the skin of the face in us is movable, because musculous and fibrous.

V. Though the substance of the tongue be not a musculous or



or fibrous flesh, yet it receiveth its divers motions from divers muscles. 2. The muscles of the abdomen are chiefly made for pressing of the same, when nature desires to expel the excrements, and in the next place to move the breast with the other muscles appointed for respiration. 3. The muscle of the bladder called Sphincter, was made partly for opening a passage for the urine to passe away, which it doth by dilating and extending it self; and partly for shutting up of the bladder by contracting it self, lest the urine should passe from us in sleep, or against our wills whilest we are awaked. 4. The muscle called diaphragma, or the midriff, was made for expiration and inspiration; in inspiration, it dilateth it self, but in expiration, it is contracted upward, as we see in dead bodies. 6. The muscles of the ribs called Intercostrals, are some of them external, which distend the breast for inspiration, some internal, which contract the breast for expiration.

V I. *Aristotelians* will have the flesh, *Galenists* the skin to be the organ of tact: but I think both are; for I take the skin to be nothing else but the outward superficies of the flesh, a little dried and hardned; and differing no other way from the flesh, then the outward skin of the apple, from the softer substance thereof; so then the flesh, both as it is a soft substance, and as it is hardned in its outward superficies, is the organ of tact, by means of the nerves and fibres diffused into it; and whereas vision, hearing, and smelling, have the air for their medium, tact and taste, which are the two absolutely needfull senses, without which we cannot live, (whereas without the other three we may) have no medium at all.

CHAP. VIII.

1. *Blood, milk, &c. No integral parts.* 2. *How the parts draw their aliment.* 3. *And expel things hurtful.* 4. *Of the intestines and faeces.* 5. *The intestines retentive faculty.* 6. *Of the stomach and its appetite or sense.* 7. *Whether the stomach is nourished by Chylus or blood.*

**B**LOOD, Milk, Fat, Marrow, are not properly integral parts of our bodies, for the body is perfect in its limbs and members, without these; and these in time of hunger, nourish the body, whereas one part cannot be the aliment of another; besides every part hath its figure and shape.



but these have none; yet in a large sense they may be called parts, as they help to make up the whole.

II. As the Loadstone draweth Iron, and Plants nutriment from the earth, so doth every part of our bodies draw that aliment which is most proper for it: some by the help of the fibres, as the heart in its *Diastole* draws blood from *Vena cava* into its right ventricle by the help of the fibres: some without their help, as bones, gristles, and ligaments. So the Intestines draw without fibers, the Chylus from the Ventricle, with which they are delighted; and they draw blood from the *Meseraick* veins, with which they are nourished; and the same veins draw the purer part of the Chylus from the Intestines for sanguification.

III. The same part that draws things needful, expels the same things when they grow superfluous or hurtful: thus the ventricles expel the Chylus into the Intestines, and these expel their grosser and excrementitious parts out of the body: so the heart expels by its transverse fibers, blood, and spirits, and hurtful vapours too. And indeed nature is more solicitous in expelling of things hurtful, then in attracting of things needful. Thus we see in dying people, that expiration is stronger then inspiration, nature being more willing to be rid of hurtful vapours, then to receive fresh aire: so when the intestines are affected with inflammations, obstructions, or ulcerations, that they cannot send the excrement downward, they force it upward into the stomach again, and so expel it by the mouth, as in the *Iliaca passio*.

IV. The expulsion of the *Fœces* is partly the natural or peristaltick motion of the intestines, and partly the voluntary motion of the muscles of the *Abdomen*; which muscles being contracted, presse the intestine. 2. There are straight Fibers in the intestine, called *Rectum*, not so much for attraction, as for strengthening the circular Fibers. 3. The Colon is seated uppermost neer to the bottome of the stomach, and hollownesse of the liver, that by the touch of these parts, the remainders of the meat which are in the cels of the Colon, might be better concocted. 4. The stink of the *fœces* proceed partly from the superfluous humidity, which is the mother of putrefaction; and partly from the heat of the intestin, which though it be natural to the aliment which it concocts, yet it is external to the excrement which it expels. 5. The length of the intestines, which are seven times as long as the body, and the many windings or folds of them, besides the *Valvula* or



or shutter in the end of the *Cæcum*, do shew that the injections by the fundament can ascend no higher then the blind intestine, except there be any of those three distempers in the guts, which I mentioned but now, or else the stomach be distempered by *Bulimia*; for in such a case it will draw the fœces to it. 6. Clysters are sometimes carried to the liver by means of the meseraick veins, which suck some part of it from the intestins.

V. The substance, temper, and colour of the intestines and ventricles, is the same; therefore the Chylus is not only concocted in the ventricle, but in the intestins also; and as the one of these members is affected, so is the other. 2. As in the intestines there is an attractive, concoctive, and expulsive faculty, so there is also a retentive; for all these affections are in the ventricle which is of the same substance with the intestines. To what end are stiptick or restringent medicaments, used in Fluxes, but to corroborate the retentive faculty of the intestins; in the lientery the meat passeth away without concoction, because the retentive faculty both of the ventricle and intestins is hurt.

VI. The mouth of the stomach being united to the Diaphragma, and this to the breast-bone, is the cause that we find much pain about this bone, when the mouth of the stomach is ill-affected. 2. In the mouth of the stomach is the seat of appetite, by reason of the two stomachical nerves there, which when they are refrigerated or obstructed, the appetite is dissolved: as in *Bulimia*, where there is a continual attraction from the stomach, but no sense or appetite; but when the stomach is molested with cold and sower humours, there is a continual sense or appetite, though there be no inanition of the part, as in the disease called the Dogs appetite. 3. By reason of the sympathy that is between the mouth of the stomach, and the heart, they had of old the same name, and they have the same symptoms. 4. The appetite being an animal faculty, hath its seat in the braine originally, in the stomach subjectively; the faculty is in both, but the action onely in the stomach.

VII. Though the stomach be delighted and satisfied with the meat it receiveth; yet it is not thereby immediately and properly nourished, but by the blood; therefore nature hath furnished it with divers veins: neither can the Chylus be fit nutriment, till it be turned into blood, & the cholerick, melancholy & watrish excrements be separated from it. Besides, how can the stomach



stomach be nourished with *Chylus*, when the body is red only by Clysters, which the liver sanguifies: or how are those creatures fed with *Chylus*, which eat not, but sleep all the Winter. The animal or sensitive hunger therefore of the ventricle, is satisfied upon the receiving of meat; but its natural hunger is not satisfied till the blood be converted into its substance.

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CHAP. IX.

1. *The Livers heat inferiour to that of the Stomachs.* 2. *Of the natural Spirits in the Liver, and how it is cherished by air.* 3. *Of the Gall, and how it is nourished. How the Choler is conveyed to it; of its two passages, and one membrane.*

**T**Hough sanguification and the separation of the three excrementitious humours from the blood, bee the work of the Liver, not of the Stomach, yet it will not follow, that the Liver is hotter then the Stomach: for this work is done not so much by heat, as by the temper and constitution of the Liver: although I deny not, but heat hath in this its action, which cannot be so great in separating the parts of the blood, which is a liquid substance, as that of the stomach and intestins concocting hard and solid substances into liquid, and separating the earthy excrements from the purer parts.

*II.* The Liver sends by the Veins into all parts of the body, these spirits which they call natural: for to send up the force of the innate spirits, which are in every part of the body: these natural spirits are grosser then the vital and animal, therefore contained within the thin walls of the veins; and they are begot of blood, and thin vapours, therefore are preserved and cherished by the blood and air; which air cannot come to the Liver by inspiration, but only by transpiration, which is performed in the hollow of the Liver by arteries in the convex or gibbous part of the Liver, by the continual motion of the Diaphragma.

*III.* Nature hath fastned a little vessel to the Liver, for reception of the choler, which because it is noxious to the Liver, it is thrust out by it; and because of the sympathy it hath with that little vessel, it is drawn in by that by a secret instinct, as Iron by the Load-stone; with which notwithstanding it is not fed, being a pure excrement: the Lungs indeed  
are



are fed with cholerick blood, the Spleen with melancholick blood, the Kidneys with watrish: but not with pure excrementitious choler, melancholy, and water. That Vessel then is fed by blood, communicated to it by its two veins called *Cistice*, which were not placed there in vain. And though this humour be pernicious to other parts of the body, yet it doth no way hurt this little vessel, which argues the great sympathy and familiarity that is between them. 2. The obliquity of the passage by which the choler is carried from the Liver to the Gall, is no hindrance to its motion, seeing this motion follows not its Elementary form, but the attractive faculty of this vessel: thus the watrish blood which is heavy, is drawn upward by the brain. 3. The Gall hath two passages, one from the Liver, by which it draws the choler, the other from the *Duodenū*, by which it thrusts out the choler into the intestins, when it becomes offensive, either by its quantity, or by its acrimony, which it may contract with long stay in each of these 2 passages; there is a *Valvula*, or shutter, the one is to keep the reflux of the choler from the gall to the Liver; the other that it may not recoil from the intestine into the gall. 4. They in whom the passage of the gall reacheth to the bottom of the stomach, are troubled with often vomiting of choler; but they in whom this passage reacheth below the *Duodenum*, are troubled with cholerick dejections. 5. The Gall, as also the Bladder, have but one membrane, whereas the stomach and intestins have two, because these were appointed for concoction, whereas the Gall and Bladder were only made to contain for a time the choler and urine.

## CHAP. X.

- I. The use of the Gall, and Spleen, its obstructions, its Veins and Arteries without concavity. 2. *Vas venosum*. 3. How the Spleen purgeth it self. 4. The Veins and its humours. 5. Why the stone causeth vomiting and numbness in the thigh. 6. The bladder, its attraction and expulsion.

AS nature hath made the Gall to receive the choler, that the blood may not be therewith infected, as sometimes it is when the Gall is obstructed, whence comes the yellow Jaundise; so it hath ordained the Spleen to receive the grosse and melancholy blood, that the purer blood may not bee infected with



with it, as it is in the black Jaundise. 2. There is no member so much subject to obstructions, as the spleen, which cannot proceed from its vessels, for they are capacious; nor yet from its substance, for that is spongy: therefore it must be caused by the feculency and thicknesse of blood. 3. It was fitting that the Spleen should abound in arteries, that the grosse blood thereof might receive the vital faculty, and that it might bee the more attenuated and purged, and the languishing heat thereof excited. 4. It was not requisite that there should bee any sensible capacity in the Spleen, as there is in the Gall and Kidneys, because the melancholy humour is much lesse then the choler or watrish, neither was it to be sent away in that plenty as the other are: Besides, in stead of cavity, it abounds in Veins and Arteries.

*II.* There is a short vessell called *Vas venosum*, reaching from the Spleen to the bottom of the Stomach, and conveying some part of the melancholy blood thither, for exciting the appetite, and binding of the bottom of the stomach the closer for helping of concoction, which it doth being of a cold, sowe, and stipick quality.

*III.* The Spleen oftentimes purgeth it self, by the internal Hemorrhoids, which arise from the Splenetical vein: and sometimes by the urine, not through the emulgent veins, which are far distant from the Splenetical; these having their originall from *Vena porta*, the emulgent from *Vena cava*; but through certain arteries made purposely large, not so much for carrying of the spirits, as of this humour, which is still accompanied with much water for attenuating the thick humour, therefore melancholy men are much given to spitting, sweating, and urine, chiefly in a quartan Fever. Hence melancholy is called water sometimes.

*IV.* The Kidneys were made to draw and contain for some time the serous or watrish excrement of the blood, which by the Uriners it sends away to the bladder: but the crude humours which critically are evacuated by urine, are not drawn in by the Kidneys, but sent thither by the veins; neither is the liquefaction of the solid parts in a Hectick, sent by the veins being weakned, nor drawn in by the reins being against nature, but of it self is conveyed thither thorough the capacious vessels.

*V.* Such a sympathy there is between the stomach and the reins, by reason of the nerves common to both, and of the outward tunicle of the reins arising from the *Peritonæum* which is



is joyned to the bottom of the stomach, that in fits of the stone, we are troubled with vomiting. 2. By reason of the muscle on which the Kidneys lean, which muscle is inserted in the inward part of the thigh, and by reason of the nerves inserted in that muscle, which nerves are pressed by the hardnesse of the stone in the Kidneys, we find a stupidity or numbnesse in the thigh, in fits of the stone.

*VI.* The Bladder draws the urine to it, not to be fed by the urine, for it is fed by blood; as appears by its veins, but that it may retain it till by its quantity or quality, it grow offensive, and then it is sent away, which action both of retention and emission, is partly natural, partly animal: as the urine is retained by the oblique fibres of the bladder, it is natural; as it is retained by the muscle sphincter, it is animal; so as it is expelled by the faculty of the bladder, this action is natural; but as it is expelled by the muscles of the *Abdomen*, the action is animal.

## CHAP. XI.

*I.* The Heart and Testicles, how the noblest parts: Generation without Testicles, they corroborate the Heart, their sympathy with the breast: 2. And with the brain. 3. Different vessels in the Male and Female. 4. The Matrix sympathizeth with the Head, Heart, Breasts, &c. 5. Affected with smells. Its twofold motion.

**A**ristotle will have the Heart, Galen the Testicles, to be the noblest parts of mans body: both are in the right; for if we consider the individual person, the Heart is the noblest part; but if the propagation of the Species, the Testicles have the prerogative: for without them there can be no generation in perfect creatures. 2. The Testicles are not of such absolute necessity for propagation of the Species, as the Heart is for conservation of the *individuum*. For divers creatures, as Fishes, do propagate without Testicles. 3. The Testicles, as Aristotle affirms truly, were not made only, or principally for generation, but for corroboration of the Heart by a secret sympathy and communication of spermatical spirits and heat; therefore Eunuchs lose much of their vigour, courage, and masculine heat. 4. By means of the Nerves, Veins, and Arteries, there is a great communication between the breast, and the parts contained in it, and the testicles; for oftentimes the tumor of the testicles end  
in



in a cough, and so the cough sometimes ends into the Testicles: And hence it is that the voice begins to grow big and hoarse in young men, as soon as they begin to have puberty and seed; because the heat of the Testicles increasing, dilates the passages of the breast and wind-pipe.

II. As there is a great sympathy between the seminal vessels and the breast, so there is between them and the brain; hence it is that imagination of venereal objects causeth erection, and upon the exuberance of seed, there arise lascivious imaginations. 2. Erection is partly animal in respect of the muscles, the imagination and delight; and partly natural in respect of flatulency, heat, and seminal spirits, which cause distension; and of the natural end, which is procreation.

III. The vessels of generation in the male and female, are not the same, as some have thought, supposing they differ only in situation, the one being inward, the other outward; which is not so, for they differ in figure, number and situation, as may be seen in Anatomies. Therefore these stories which tell us of maids turned into boyes, are false and ridiculous, except they mean Hermaphrodites, in which are the vessels of both sexes, which are not discerned while they are young, because of the weakness of heat in them; so at first some young boyes have been taken for maids, because the yard and testicles for want of heat, have not appeared outward.

IV. Such a sympathy and combination there is between the matrix and the head, by reason of the nerves; that when the matrix is ill-affected, the head and brains are ill-disposed; and oftentimes the sensitive, animal, and motive faculties are overthrown; hence convulsions, stupidities, and strange disturbances of the imagination. 2. By reason of the arteries, such a sympathy there is between the heart and the matrix, that swooning fits, and suffocation, with a cessation of pulse, and respiration follow upon the distemper of the matrix. 3. Such a consent there is between the matrix and breasts of women, that sometimes blood hath flowed from the breasts instead of milk, and milk hath been voided downward instead of blood. 4. By reason of the consent between the liver and the matrix: the veins and matrix, the bladder and the matrix: the evil disposition of this is the cause of distempers and diseases in them.

V. The matrix is much affected with smells; not that the sense of smelling is there, which is in the brain, but because of the consent that is between the matrix, and the membranes of the brain; they being both of the same substance; and because



cause with the smell the thin vapors are conveyed thither, on which the spirits are fed. 2. Sometimes abortions are caused by bad smells, because the maternal spirits which the child attracteth by the umbilical arteries are infected. 3. Sweet smells do cause in some women hysterical passions, because they stir up the pernicious vapors that lay lurking in the matrix, which vapors are conveyed by the arteries to the diaphragma, heart and brain; whereas by stinking smells nature is stirred up to the expulsion both of them, and withall of the naughty humors in the matrix. 4. There is a two-fold motion of the matrix; the one is natural by its straight and circular fibres, so it is moved downward towards the reception of the seed, and expulsion of the childe and secundine: the other motion is convulsive, proceeding from too much inanition or repletion; and sometimes of venomous vapours, whence are suffocations, and want of respiration, the diaphragma being pressed.

## CHAP. XII.

1. *Distinction of sexes: the male hotter then the female.* 2. *The seed no part, nor aliment of the body: derived from all parts, how.* 3. *The menstruous bloud no excrement, how it is: The cause of the small pox: Its evacuation.* 4. *The uses of the matrix.* 5. *Its vitiosity, the cause of Monsters: Mola, what.*

I. **A**S nature hath appointed generation for continuing of the species, so it hath appointed distinction of sexes, aiming as well at the female, as the male, and not at the male alone, as some think, who would make the female an imperfect thing, and aberration of nature: for the one sex is no less needfull for procreation then the other. 2. The male is hotter then the female, because begot of hotter seed, and in a hotter place, to wit, the right side; and because the male hath larger vessels and members, stronger limbs, a more porie skin, a more active body, a stronger concoction, a more courageous minde, and for the most part, a longer life; all which are effects of heat. Besides that, the bodies of males are sooner articulated and conformed, to wit, by 10 days, in the womb, then the females are; the motions of the male in the womb, are quicker and stronger, then of the female. The fatness, softness, and laxatie of the womans body, besides the abundance of blood, which cannot be concocted and exhaled for  
want



want of heat, argue that she is of a colder temper then the man: She indeed hath a swifter pulse, because of the narrowness of the arteries, and her proneness to anger and venery, argue imbecility of minde, and strength of imagination not heat. 3. The male groweth slower then the female, because he was to live longer; therefore nature proceeds the slower, as we see in trees and plants; a Cherry-Tree groweth up sooner then an Oak, and decayeth far sooner. Besides, the soft and loose flesh of the female is sooner extended, then the solid and harder flesh of the male: We may then conclude, that the male is hotter intensively; but the female by reason she hath more blood, is hotter extensively.

II. The seed is no part of the body, because the body is not more perfect by its presence, nor maimed by its loss or absence; nor is it the aliment of the body, because then the body would not part with it: nor is it properly an excrement peccant in the qualitie; but it is the purer part of the blood, or quintessence of it, unuseful for the body when it is peccant in the quantity. 2. Because the blood is in every part of the body, and the seed is the quintessence of the blood; therefore the seed may be said to be derived from all parts of the body, for all parts of the body consume upon much evacuation of seed; and as it is from all parts, in respect of its material and grosser substance, so it is principally from the head, heart, and liver, in regard of its more aerial parts.

III. Though the menstruous blood may receive corruption by its long suppression, or by the moisture of some bad humors, yet in sound women, it is as pure as any other blood in the body: For it is appointed by nature for nutriment of the infant, whilst it is in the womb; and after birth it is converted into milk, neither doth it differ from other blood in its material and efficient causes; besides that, it is as red, and coagulates as soon, as the purest blood of the body: Neither doth nature send it away because it is peccant in the quality, but because it is exuberant in the quantity. 2. By reason the menstruous blood is infected with ill humours, on which the child in the womb feeds; hence it is, that there are few or none, but one time or other are infected with the small pox; which as divers other poisons, doth not presently shew it self, but lieth a long time lurking in the body: And if at the first time, the venome of this disease is not thoroughly purged out, it returns: Hence it is, that some have this disease divers times.

3. The menstruous blood is not the cause of the small pox,



whilst it remains in the vessels, but when it is converted into the substance of the body; hence it is, that women whose moneths are stopped, are not infected with this malady. 4. This blood is evacuated once in a moneth ordinarily, at such time as the Moon, which hath dominion over humid bodies, is most prevalent: Nature also observes her own periods, and times of evacuation, of which we can give no reason. But this is certain, that if the evacuation of this blood were as frequent as of other extrements, there would be no conception.

IV. The chief uses of the matrix are to draw the seed to it, to mingle it with the blood, to contain it, to excite its faculties and spirits, for it is not actually animated till now, and so the seed by its spirits is made capable of animation, and shortly after being incorporated with the blood of articulation: These fore-named functions of the matrix are performed, not so much by its heat, as by its natural temper.

V. Oftentimes the vitiosity of the matrix is the cause of monstrous births; so likewise is the imagination, the defect or exuberance of seed; the unlawful permission of seeds, the heat of the body, and the formative faculty. 2. The false conception called *Mola*, is begot when the seed is faulty, weak or deficient, and the blood predominant; which is known from a true conception, because there is no milk in the breasts, when there is a false conception, neither doth it move after the fourth moneth, as the child doth; sometimes it is moved by the matrix, but not by it self, as the child: besides it remains after the eleventh moneth, which is the time prefixed for the birth of the child.

CHAP. XIII.

1. The Heart liveth first, not the Liver.
2. The outward membrans first formed by the heat of the matrix.
3. *Urachos*, what.
4. The similitude of the parents on the children.
5. Twins, how begot, and why like each other.
6. Infants, how fed in the matrix.
7. Superfetation.
8. No respiration in the matrix.
9. The child's heart moveth in the matrix.

I. **A**RISTOTLE will have the heart to be the first member that lives in us, Galen the liver; but indeed Aristotle is in the right; for how can any thing live, till the heart which is the fountain of heat and spirits live; and how can the



soul frame to her self a fit habitation for exercising of her functions, till first she hath framed the heart, by whose heat and spirits she may work: If it be objected, that the heart cannot live without nutrition; but nutrition is by blood, and this by the liver, therefore the liver must first live: I answer, that there needs no nutrition, till the body be compleat and perfected; for wee see imperfect creatures can live long without food: I have kept a Spider nine moneths alive in a glass without food: Again, there needs no nutriment, but when there is deperdition and wasture of the substance, which cannot bee of the heart, before the body be perfected. And although the body live at first the life of a plant, it will not therefore follow, that the heart is not first framed; for even in plants there is a principle of life, which is the root, and nature worketh methodically, by quickning that first, which must quicken the rest.

II. As the heart is the first member that is framed by the formative faculty, so the outward membranes are first formed by the heat or natural temperament of the matrix, as we see the outward skin of fruits by the heat of the Sun. For nature providently fences the seed with these walls, that the inward spirits may work the more powerfully, and be the lesse subject to dissipation.

III. Besides the umbilical vein and the two umbilical arteries, nature hath made a vessel called *Urachos*, by which the child in the matrix conveys the urine into the membran, for it reacheth from the bottom of the bladder to the navel; and in those in whom the navel is not well bound at first, and this *Urachos* dried, upon any stoppage of the bladder, the urine will flow out by the navel.

IV. The similitude of the parents is impressed on the children, partly by reason of the formative power in the seed, and partly by the imagination of the parent moving the spirits, which being mixed with the blood on which the child is fed; makes the impression upon the tender flesh of the infant. 2. The childe resembleth the grand-fathers or grand-mothers sometimes, as the Load-stone communicates its power to the third or fourth needle, so doth the formative faculty of the grand-father, which is potentially in the seed of the grand-childe, oftentimes show it self.

V. Twins are oftentimes begot, partly because of the abundance of seed, partly by reason of the scattering thereof into divers parts of the matrix, which foment each part of it; for though the matrix hath no cells, yet it hath a right  
and



and a left side; in the right, males; in the left, females are begot; or if the seed be strong, vigorous, or masculine, males, if weak and feminine, females; if one part masculine, the other feminine, then male and female are ingendred; but the female is seldome strong or lively, because the time of conformation is not alike in both, 30 days being required for the forming of the male, and 40 for the female. 2. Twins are like each other, because they are wrapped within the same membran, are conceived at the same time, they feed on the same blood, and enjoy the same maternal spirits.

VI. The infant in the womb is not fed by the mouth, but by the navel; for there are no vessels that reach to the mouth, neither is there need of chylication, or sanguification; neither is there any other excrement found in the intestins of new born infants, except the excrement of blood; therefore as they breath by the umbilical arteries; so they are fed by the umbilical vein.

VII. Sometimes there is superfetation; for we read of second births, some days, weeks, and moneths, after the first; which shews, that the matrix after conception, is not so fast bound, but that it openeth again in copulation, but seldome is the second birth either strong or lively; because the first conception groweth strong and big, drawing the blood or nutriment to it, by which means the second conception is starved.

VIII. The infant doth not, cannot, should not breath whilst it is in the womb, but is content with transpiration by the umbilical arteries. For if there were inspiration, there must be air within the membrane where the child lieth, but there is nothing except the child, and that watrish substance in which it swims; this must needs be suck'd in with the air, and so the childe be choaked. Besides, the rednesse and grossnesse of the lungs, whilst the childe is in the womb, shews, that it breaths not; for the lungs of those creatures that breath, are of a whitish colour, and of a rarified substance, for the better reception of the air.

IX. Whilst the child is in the womb, the heart is not idle, as some *Galenists* imagine, but according to *Aristotle*, it then moveth and giveth life to the body: otherwise the childe should live all the while the life of a plant, not of an animal, if it had no other life then what it hath from the mother by the umbilical arteries. 2. How could the heart, having no air to refresh it within that narrow membran, in which the child lieth, receive refrigeration, if it did not move; some answer, that



the heart is refrigerate by the water in which the child lieth. I should like this answer well, if that water were cold; or if the child were a fish, which with its gills might receive water for refrigeration of the heart. 3. The arteries of the child move, but how can they move without the heart move also. If they say, that they are moved by the Arteries of the mother, I would know how they can move after the mother is dead; for some children have been cut out alive from the dead mothers womb. 4. Although the umbilical arteries convey the material spirits to the child, yet they give not life, no more then the aire which we breathe, till they be refined by the heat and motion of the heart. 5. The animal spirits of the childe are begot in its brain, whilst it is in the womb; but the animal spirits have their original from the vital.

## CHAP. XIV.

1. *Child-bearing how caused.* 2. *Why the eight months birth not lively.* 3. *The sensitive Soul how derived, and the reasonable introduced: when it exerciseth its functions: it brings with it all its perfections. The Embryo not capable of three specifical forms.*

**T**HE birth of the child is caused partly by its calcitration, breaking the membranes in which it lieth, having now need of more food and spirits, by reason it is grown bigger and stronger; and partly by the contraction of the matrix, endeavouring to be rid of the burthen; if either of these fail, the birth will be the more painful and difficult; but the *Mola* having neither life nor motion, and not standing in need of air and food, remains in some many years together before it be expelled. 2. The causes of difficult child-bearing, are partly the bigness of the child, partly the narrowness of the neck of the matrix, or the weakness of the child, or the mother, or inflammations, or tumors, and such like infirmities, whether natural or adventitious.

11. The reason why the childe which is borne the seventh moneth, is for the most part lively, whereas that which is born in the eighth moneth is not, because the seventh moneth the child having attained the perfection of parts, and so much strength as to break the membrans, doth live; but if it cannot break the membran till the 8 month, all the time it remains frō the first attempt it made of going forth, it doth not prosper, but decays in strength, being as it were against its will kept in prison.

111. The



*III.* The sensitive Soul is derived with the seed from the parents; which soul is potentially in the seed, but actually in the Embryo, where the members are formed. But in the fourth month after the heart and brain are perfected, the reasonable soul is introduced; which if it were taken out of the matter, it should in reasoning and understanding depend altogether on the matter, which were absurd to think. 2. The rational soul doth not exercise its functions, untill the superfluous moisture of the body, by the natural heat, be exhausted, and the organs made drier. 3. The bodies of other creatures, are not capable of mans soul, because they are not of that fabrick, temper, and constitution. 4. The faculties of the animal soul have not their originall from the gross and earthy part of the seed, but from the aereal, by means of its celestial heat. 5. The rational soul bringing with it all its perfections, the former faculties of sense and vegetation which were in the Embryo, give place to it; so that now it alone works by its faculties. 6. The seed brings with it from the parents, its own heat, by which the formative faculty worketh; the heat of the matrix is not operative, but conservative of the other heat. 7. The seed consisting of grosser, and aereal parts, cannot be called uniform; and if it were, yet it may have divers operations and faculties *ad extra*; so hath the Sun, and other uniform bodies. 8. The Embryo is not capable of three specificall forms or souls; for so it should be a threefold compound specifically distinct; but it is capable of divers generical forms and subordinate, the superior being preparatives for reception of the inferior and ultimate specificall form, which giveth name and entity, as the rational soul doth to the child being perfected.

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C H A P. XV.

1. *Why about the fourth month milk is engendred, and of what.*  
 2. *The effects of the Diaphragma inflamed.* 3. *Pericardium.*  
 4. *The Hearts Flesh, Fibres, and Ventricles.* 5. *The Heart why hot and dry.* 6. *The vital faculty.* 7. *The vital spirits how ingendred.* 8. *Systole and Diastole.* 9. *The Hearts motion.*  
 10. *How caused.*

**A**S soon as the child groweth big, about the fourth month, the menstruous blood flowes upward to the breasts, and when the child is born, it flowes from thence; and being



suck'd by the child, the veins of the breasts do avoid vacuity, draw the blood upward for generation of new milk. 2. In the breasts of Virgins, and of some men also, there is sometimes found a whitish liquor, which is not milk, because it hath neither the tast, nor thickness, nor nutritive quality of milk. 3. The breasts, or paps, are glandulous bodies, principally ordained for generation of milk; and in the second place for reception of excrementitious humors, and guarding of the heart. 4. The reason why about the fourth month the blood flowes upward into the breasts, is, that the child growing big, and wanting sufficient food, might struggle to get out, which it would not do having sufficient nutriment. 5. It is not fit that the child out of the womb, should feed on blood as it did in the womb, because then the mouth of the veins being opened, the blood would run out, and so nature be overthrown; neither would God accustom man to blood, lest he should become cruel and bestial.

II. Upon the inflammation of the diaphragma, follow oftentimes phrensies, by reason of the society it hath by the nerves with the brain, to which it sendeth fumes and hot vapors: which phrensie is known from that of the brain, by the shortness of the breath, the chief organ of breath being ill-affected, so that the breast cannot freely move it self: and because the Diaphragma is united to the Pleura, and Peritonæum, which containeth all the organs in the inferiour belly: hence all these parts are drawn upwards by the motion of the Diaphragma.

III. The tunicle of the heart, called *Pericardium*, hath within it a water for refrigeration and moistning of the heart, which is begot of vapours, condensate by the coldness of the membrane, as some think, or else it sweats through the tunicles of the veins and arteries: they that have hot hearts have but little of this water, and it abounds most where the heart is colder; but whether the defect of this water be the cause of the heat in the heart, or the heat the cause of this defect, it is uncertain, as it is with the sea water, which is turned into vapours by the suns heat, and these vapours turned into water again by the coldness of the middle Region: so the heat of the heart turns this water into vapours, and the membrane converts these vapours into water again, and so this circulation continues till the heat of the heart be extinguished by death, then is found water onely.

IV. The heart hath a peculiar hard flesh of its own, that it might



might be the better able to undergo its perpetual motion, to contain the spirits and life-blood, and to resist external injuries. 2. This flesh is not musculous, because the motion of the muscles is voluntary, but the hearts motion is natural. 3. The heart hath both straight, transverse, and circular fibers, for attraction and expulsion; and oblique fibers also for retention; but these fibers are of the same substance with the heart, and not of a different, as the fibers of the Muscles, which are parts of the nerves and Tendons. 4. The heart is fed with gross blood, answerable to its own gross substance, by the vein called *Coronaria*, compassing the Basis of the heart. 5. The heart hath two ventricles, whereof the right is hottest extensive, as *Aristotle* will have it, for it contains the life-blood; the left is hottest intensive, as containing the vital spirits, and so *Galen* saith. 6. If we consider the situation of the right ventricle, which is in the right side, and the priviledge it hath in living longer then the left; we may with *Aristotle* say, that the right ventricle is the more noble of the two; but if we consider that the left ventricle contains the vitall spirit, which in dignity excels the blood which is in the right, we must with *Galen* give the preheminance to the left: and so these two may be reconciled.

V. The heart is a hot and drie substance, that it might be the fitter both to beget and to preserve the vital spirits; to attenuate the venal, and to procreate the arterial blood: And though the spirits be hotter extensively, yet the substance of the heart is hotter intensively; as burning coles are hotter then flaming straw.

VI. The vital faculty by which the vital spirits are ingendred for animating the body, and preserving the natural heat, is an effect of the soul, as all faculties are, and not of the heart; yet here it chiefly resides, because of the soul which here exerciseth her chief functions of life. 2. This vital faculty differs from the animal, because it is not subject to fatigation, nor rests in sleep, nor doth it accompany the imagination or apprehension of the object, as the animal doth. 3. It is different from the pulsifick faculty, because this is subservient to the vital; neither doth the pulsifick beget spirits, or is it diffused every where as the vital is. 4. The vital differs from the vegetive faculty, because the vegetive is in plants and insects, but not the vital, as it is procreative of spirits: for the dull heat of insects is not so soon spent as to need reparation by generation of spirits. 5. It differs from the animal motive faculty,



because it is necessary and perpetual; the animal is voluntary, and sometimes ceaseth.

VII. The vital spirits are ingendred in the left ventricle of the heart, partly of aire prepared in the lungs, and conveyed to the heart by the *Arteria venosa*; and partly of the purest blood, powred out of the mouth of *Vena cava* into the right ventricle, where it is prepared and attenuated, a part whereof is conveyed for nourishing of the lungs by the *Vena arteriosa*, the other part sweats through the partition that divides the heart, and in the left ventricle is mingled with the aire, and turned into spirits by its excessive heat.

VIII. The Diastole and Systole, that is, the dilatation and contraction of the heart and arteries, is all one and at the same time: for the heart and arteries are so united, that they make but one body; so there is but one pulsifick vertue in both, and the end of their motion is the same, to wit, the vegetation and life of the body; the suddenness of the motion in the remotest arteries from the heart, and the strong beating of the pulse and heart in Feavers and anger, do shew the identity of motion in both. 2. The arteries are moved by the spirits of the heart, conveyed by their tunicles rather than their cavity; for upon the pressing of the tunicles the pulse ceaseth; but not when the cavity is stuffed, or stopped. They are not then moved by their heat and blood, but by the heart; as may be seen by binding the arteries, whose motion beneath the binding faileth, the commerce between it and the heart being intercepted. 3. The heart is first dilated by receiving the aire, then it is contracted by expelling the fuliginous vapours. 4. The heart strikes the breast in its dilatation, not in its contraction or Systole; because the left ventricle, which is the originall of the Arteries, is distended in the Diastole, and so toucheth the breast about the left pap.

IX. The motion of the heart is not voluntary, because we cannot command it; nor sensitive, because it is not performed by the nerves and muscles; nor simple, because there are two motions; nor compounded, because they are contrary; and of contrary motions can be no composition; nor is it violent, because it is not repugnant to its nature; nor is it caused by an externall agent, as the trembling of the heart is by distempers, vapours, or humours; but the hearts motion is natural, yet not caused by the elementary form, for so there should be more agents in our bodies then one, and its motion should be either upward or downward; but it is natural in respect of the

soul,



soul, which is the chief nature that works in animal bodies; and in respect of the fibers heart, and spirits of the heart, which are natural organs; and in respect of the natural use or end of this motion; for the heart dilates it self to receive aire and blood; it contracts it self to be emptied of its fumes, and to communicate its spirits to the nerves; which ends are naturall.

X. When *Aristotle* saith, that the motion of the heart is caused by heat and cold, he contradicts not the Physitians in affirming the soul, or its vital faculty to be the cause of this motion; for heat and cold are subordinate instruments to the soul, which by the heat of the blood and spirits, dilates the heart, and by the attraction of the cold air contracteth it, as we see water by the heat of the fire swell and dilate it self, but upon the breathing of cold air, to contract and fall down again.

#### CHAP. XVI.

1. *The Lungs how moved; the air is not the spirits nutriment.*
2. *Respiration not absolutely necessary.*
3. *The Lungs hot and moist.*
4. *Respiration a mixed motion, as that of the bladder and intestins.*
5. *No portion of our drink passeth into the Lungs.*

**A** *Ristotle* differs from the *Galenists* about the motion of the Lungs; he will have them moved by the heart, whose heart lifteth up the Lungs, upon which motion the air enters for avoiding vacuity; which being entred, the Lungs fall. The *Galenists* will have their motion to depend on the motion of the breast, but both are in the right: For the motion of the Lungs is partly voluntary, and so it depends on the moving of the muscles of the breast; and partly natural, and so it is moved by the heart. 2. When *Aristotle* denies that the air is the nutriment of the spirits, which the *Galenists* affirm; his meaning is, that the air doth not properly nourish the spirits, as meat doth our bodies; for there is no assimilation or conversion of the substance of the air into our spirits, which are properly nourished by blood, but only a commixtion of the air and spirits for refrigeration: And indeed if the spirits were properly fed by the air, there would not come out the same air that went in: For the spirits would not part from their food; the air then nourisheth the spirits, as it doth the fire, by refrigeration, and preserving it from suffocation.

II. *Respiration is not so necessary for preservation of life,*

as



as the motion of the heart : for histerical women can live without that, but they cannot live without this : Neither is the motion of the arteries of absolute necessity; for the member is not deprived of life, though the arterie be stopped or tied, and deprived of its motion. 2. The motion of respiration is more noble then the motion of the heart, because this is meerly natural, that is also animal and voluntary; yet as the motion of the Lungs is subservient to the motion of the heart, that is more noble then this : for the end excels the means.

III. The Lungs are hot and moist : hot, that they might temper and alter the cold air; therefore the substance is fleshy, light and spongy, and fed with hot and spirituous blood from the right ventricle of the heart. It is also moist, as appears by its soft and loose substance : It is also moist accidentally by receiving the flegme and rhumes that fall from the brain. 2. The Lungs refrigerate the heart, not because their substance is cold, but because the air is cold which they attract.

IV. Respiration is a motion partly voluntary, as it is performed by the muscles, nerves, and diaphragma, which are the organs of voluntary motion, and as it is in our power to breathe or not to breathe; to hasten or retard it : And it is partly natural, as it is performed by the Lungs, which are organs of natural motion, as it is not subject to fatigation, as it is performed in our sleep, when we have no command over our selves, and the sensitive faculties then cease; as it is not performed by election, or apprehension of the object, as voluntary motions are : And lastly, as in Apoplexies, when the senses fail, the brains and nerves are hurt, yet respiration continues; it is then a mixt action, as the expulsive actions of the bladder and intestines are. So is the motion of coughing; for as it is performed by the muscles, it is animall, but as it is stirred by the expulsive faculty, it is naturall; and as it proceeds from some morbifick cause, it is preternatural. So deglutition or swallowing is an animal action as it is performed by the muscles, and is some times hindred by imagination; for we swallow with much ado, those things of which we have no good conceit. It is also natural, as it is performed by the attraction of the fibres which are in the external tunicle of *Oesophagus*. Now attraction is subservient to the nutritive faculty, which is naturall.

V. That no portion of our drink can pass into the lungs, is plain; because we cough if the least drop of rhume fall from the head upon the lungs: besides, our breath and voice should be presently stopped, the light and spongie substance also of the lungs, would



would be hurt and corroded when we drink any sharp or soure liquors, or medicaments: Therefore in swallowing, the *Epiglottis*, or little tongue of the wind-pipe covers the *Larynx* or top of the *Aspera arteria*, that nothing may fall into it; yet the sides of *Aspera arteria* are moistned by syrups, which somewhat ease our coughing.

## CHAP. XVII.

1. *All the senses in the brain.* 2. *How made for refrigeration only, how hot, cold, and moist; and why; its actions.* 3. *How void of sense and motion.* 4. *The animal spirits, what, and how begot.* 5. *Why more vital then animal spirits; where perfected, and prepared, the ventricles of the brain.*

**A**S the heart is the first, remore, and mediate originall of motion and sense, because the spirits and heat are originally from thence, so the brain is the secundarie, proximate, and immediate organ of the senses, which have their particular seats there; to wit, the 5 externall senses, and the 4 internal, namely, the common sense, the imagination, the discursive, and memorative qualities, which have their distinct cels. The common sense is placed in the substance of the brain, the imagination in the fore cel, the discursive in the middle, the memorative in the back cell; the fore cell is softer, the back cell somewhat harder, the middle is of a middle temper; sometimes the one is hurt, when the other is sound, a good memorie may accompany a bad imagination; and contrarily.

*II.* When *Aristotle* saith that the brain was made only for refrigeration of the heart, his meaning is not as the *Galenists* think, that the brain was made for no other use, but that neither the brain nor heart could be any way useful, if the heat of the one were not tempered by the cold of the other; for all our frame is out of order, when the brain is overheated or inflamed; and though the brain be not actually cold, yet by its moisture and weak heat, it tempers the excessive heat of the heart and vital spirits, by means of the arteries which are common to both these organs; therefore it is that the brain hath not blood and veins. 2. The innate temperament of the brain is cold, the adventitious is hot; that is, it is hot by means of the spirits from the heart, but cold in its own substance. 3. It was made cold and moist, that being the seat of imagination, and of the attenuated animal spirits, the one might not be distempered with heat, nor the others dissipated. 4. It is moist, that it might be the fitter for generation



generation of the nerves, for receiving the images and impressions of things with the more facility, and the more apt for sensation, which consisteth in passion. 5. The actions and functions of the brain depend both upon its right fabrick and conformation, as also upon its temper; for if either of these be hurt, the actions of the brain are vitiated.

III. The brain is void of sense in its own substance, but sensitive in its membranes; nor was it fit that the brain should feel, seeing it is the common receptacle and judge of all the senses: and seeing it is in the highest place, and receives all exhalations from the inferior parts, it should be continually molested, if it were sensible of all these vapours. 2. As it is void of sense, so it is of motion in it self, it is indeed moved by the arteries, for the feeding, purging, and tempering of the animal spirits; but the brain being the original of motion, ought to be immovable in respect of self motion, neither are there any fibres in the brain by which it should be moved, as there are in the heart; neither could ever the motion of the brain be observed, other then what is caused by the arteries.

IV. The animal spirits are so called, because they are the chief organs of the soul, for her chief actions of sense and motion without the brain: of imagination, discoursing, and remembring within the brain; therefore these spirits receive from the senses, the images and species of things, and convey them to the brain, where they retain them for the soul, by the phantasie to work upon. 2. These animal spirits are begot of the vital, but are cherished and refreshed by the external air, drawn by the nostrils to the brain; so that without air, and vital spirits, the animal cannot long subsist; and because blood is the remote matter of the animal spirits, they grow feeble when much blood is evacuated.

V. Because there is more need of the vital then of the animal spirits, therefore more plenty is required of them then of these; for nothing is begot of the animal spirits, therefore they waste not so fast as the vitall, of which the animal are ingendred; besides, the vital spirits are perpetually employed even in sleep, so are not the animal, but they rest then, nor is there any part of the body which hath not life; but divers parts have not sense, which is an animal function, as the bones and ligaments. 2. The animal spirits are prepared in the intricate labyrinth of arteries within the brain; but they receive their perfection in the cels thereof. 3. Though the faculty of sense be an inseparable property of the soul, yet it doth not always operate, but where there is a fit organ; in sleep the soul is in  
the



the eye, but then seeth not. 4. The ventricles of the braine serve not onely for generation of the spirits, but for purging out also of superfluous excrements.

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CHAP. XVIII.

I. *The eye both watrish and fiery, imperfect vision.* 2. *Why the eye is watrish, its action, spirits, and species.* 3. *Spirits of the eye proved: two eyes, but one motion; why the object appears double sometimes, no colours in the eye.* 4. *The optick nerves soft, where united, and why.* 5. *The Chrystalline, and glassy humours, and white of the eye.*

**T**Hough the substance of the eye be watrish, as we shewed before, yet the visive spirits are fiery, as may be seen by their light in the dark, their mobility, and their resistance to cold, for they are not molested with it as other members are. 2. When the imagination is vitiated, or the spirits subservient to the same are disturbed, or an opac vapour is interjected between the *Cornea* and chrystalline humor, wee seem to see things and colours in the air, which are not there, but this is an imperfect vision, because there is no reception of species from the air, nor is the organ distinct from the medium and object, nor is there that distance between the organ and the object, as is required in perfect vision.

II. The eye should be of a watrish substance, not fiery; because water is dense and diaphonous, fit to receive the species as it is diaphonous, and to retain them as it is dense, so is not the fire; for though it be diaphonous, it is not dense, therefore not fit to retain the species. 2. The species being spiritual or immaterial, do not affect or hurt the eye, but the colours only hurt the eye more or lesse, as they participate more or lesse of the light, which dissipates the visive spirits, these being lucid, spend themselves on lucid objects, by reason of their cognate quality. 3. Sometimes the eye is wearied with seeing, not as vision is a reception, and so a passion, but in respect of the visive spirits which are agents. 4. The eye in an instant perceives its object, though never so far distant, because the visible species are in the air contiguous to the eye, though the object be distant.

III. That there are spirits in the eye, is apparent by the dilatation of the Ball of one eye, when the other is shut; which

is



is caused by the spirit passing from one eye to the other, and by reason of these spirits the eye is more cheerful at one time then at another. 2. Though there be two eyes, and divers muscles, yet they are moved but with one motion, because otherwise one object would appear as two. Thus by lifting up one of our eyes with our finger, the object we look upon, appears double, because the two Balls of the eyes are not upon the same superficies, nor do the beams of both eyes equally reach the object. Thus it is with drunkards and goggle eyes, and in convulsions of the muscles of the eye. 3. There are not properly any colours in the eye, because then the object would seem to be of the same colour that the eye is of; yet the eyes seem to be coloured, because they are visible.

IV. The optick nerves seem of all others the most soft and spongy, that they might bee the lesse offensive to the eye the most tender of all other members, and that they might convey the greater quantity of optick spirits. 2. They are united into one, about the middle way between the brain, where they have their beginnings, and the eyes into which they are inserted, that by this union they might be the stronger, and that they might be equally implanted into the same superficies of both eyes, lest the visive spirits being unequally communicate, should occasion the object to appear double.

V. The ChrySTALLINE humour is a part of the eye, because it hath its life, nutriment and function; as other parts have; it is also both a similar part in its temper and substance, and it is organical in its situation and figure. 2. The glassie humour is also a part for the same reasons; therefore the ChrySTALLINE doth not feed upon it, for no part feeds upon another, but it prepares the blood, and alters it for the ChrySTALLINE, lest it should be infected with a red colour; it affords then the same service to the ChrySTALLINE, which the stomach doth to the liver. 3. The white of the eye is a part thereof, and no excrement, for Nature excludes excrements; but if this white should perish, sight faileth, for it is as a Bulwark to the ChrySTALLINE, and conveyeth the species to it.



## CHAP. XIX.

1. Five things required to hearing. 2. Not the real but intentional sound is heard: Hearing fails last in drowned men. 3. The innate air no organ of hearing: no spirit, or part of the body. 4. The cause of the sympathy between the ear and the mouth.

**I.** FOR the sense of hearing are required, 1. A sound, which is caused by the collision of two solid bodies, or of the air and of another body. 2. Air which is the medium that receiveth and carrieth the sound, whereas the water in respect of its thickness carrieth the sound but imperfectly and dully. 3. The ear containing in it the thin and dry membrane called the drum, which if it be thick, or too much moistned, hindreth hearing. 2. Three little bones called *Incus, malleus, & Stapes*. 3. An innate and immoveable air. 4. A winding labyrinth, that the external air and sound may not too suddenly rush in upon the nerve of hearing. 5. This auditory nerve carrieth the sound to the brain, that there the common sense and fantasie may judge thereof.

*II.* The sound which is carried into the ear is not real, but intentional and spiritual, or the species and image of the real sound; for how can a real sound passe through a thick wall, or multiply it self in a thousand ears, in an instant, or in so short a time, reach twenty miles from any canon to the care. 2. The winding labyrinth in the ear is the cause, why men that are drowned lose the sense of hearing last, because the water cannot passe through that winding *Meander*.

*III.* The innate air of the ear is not the organ of hearing, but a medium, for it differs not from the external air, nor can that be an organ which is no part of the body, either spermatical or sanguineal, as Physitians use to speak, neither is it animated by the soul, for the soul is the act of organical bodies onely: Nor is it a spirit either animal or vital, because it is not contained within the nerves or arteries; and being it is not a mixed, but a simple body, it can be no part either similar or dissimilar.

*IV.* By reason the auditory nerves do impart some branches to the tongue; hence it is, that there is such a sympathy between the ear and mouth. That this is a help or hindrance to our hearing, and this to speaking, so that if the auditory nerves be stopped or deficient, not onely deafness but dumbness is caused;



fed ; and we finde that those who hear hardly, speak little, and such as are born deaf, are born dumb too : and if we hold a musical instrument with our teeth, and stop our ears, we shall hear the sound perfectly.

## CHAP. XX.

1. *How wee excell the beasts in smelling. Wee smell reall odours.*  
 2. *Smells nourish not.* 3. *The nose, not the brain is the organ of smelling.*

**I.** **T**HOUGH the beasts excel us in the sense of smelling in respect of celerity, and way of reception, yet in respect of dijudication, and differencing the diversities of smells, wee exceed them : for our brains being bigger, colder, and moister then those of beasts, cannot so quickly receive the smell. But because of the reasonable soul, we judge better of the differences. 2. Though the species of colours and sounds are received into the eyes and ears, yet real odours are received into the nose ; for the head, heart, and spirits, are diversly affected with smells ; some men have been cherished a long time with them ; some women are suffocated with smells ; some beasts are driven away ; some are allured by them ; which could not be if these were not real smells, and in that smells are carried to and fro with the windes : And that we smell better in hot weather then in cold, doe shew, that these are not the species, but real smells. 3. Odours being accidents, cannot be conveyed to the organ, but in vapours or exhalation, which are substances ; for bare accidents cannot be transported with windes to and fro, nor can they affect the brain, or comfort it, or drive away beasts and vermin.

*II.* When *Aristotle* saith that smells cannot nourish, he is in the right ; for nothing nourisheth, but compounded bodies, now smells are bare accidents. Nutriment have their excrements, smells have none ; nutriment is converted into the substances of the body nourished, and hath a peculiar place where it is concocted ; as the stomach is the place for the Chylus ; which cannot be said of smells : Therefore *Galen* was in an error, when he said that men can be nourished with smells, except by smells he understand odoriferous exhalations, which yet nourish not properly, but for a while only recreate the spirits, because of the nearness of their substance, which spirits being

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the immediate organs of the soul, for a while can perform their functions in the body.

III. *Galen* is injurious to *Aristotle*, in upbraiding him, for making the nose the organ of smell; whereas *Galen* will have the brain to be the organ; which is ridiculous, and against his own tenents, in affirming that the brain is no ways sensitive; neither indeed can it be, seeing it is the original of the senses; and how can the same member be both the original and organ of the senses. Therefore not the brain, nor that part thereof which they call (*processus nasillares*) reaching to the nose, can be the organ of sense, but the nose itself; for they that want the nose, smell not; and a short nose smells not so well as a long; and if any part of the brain were the organ of smell, we should smell the meats in our mouth, and the vapours of the stomach, which are still mounting up to the brain: Yet we never smell them till we belch them out, and then we smell them as soon as they ascend into the nose, which is indeed the true organ of smell in that nervous membrane thereof. And how can the smell be an external sense, if it have not as well as the other four, an externall organ, by which the externall senses are distinguished from the internall. 2. Though the real smell is conveyed to the nose, and not the species, as the species of colours and sounds are to the eyes and ears, yet not the real, but the intentional smell, or species is carried by the nerve into the common sense or fantasie.

CHAP. XXI.

I. *Wherein consists the organ of tast.* The tongue potentially moist: no external medium of tast. 2. *How the skin is the medium of taste.* The prime qualities, both objects and agents. No creature without tast. It is most exquisite in man. Tast and taste different.

THE organ of taste consisteth partly in the nerves of the tongue, palate, and throat, and partly in the skin thereof, except we make the skin the medium; for when the skin of the mouth or tongue peeleveth, the taste faileth; and so it doth fail also when the tongue is drie without moisture or spittle; therefore the spittle or *saliva* may be called the medium of taste. 2. Because the organ must be potentially, what the object is actually; therefore the tongue must be potentially moist;



moist; for moisture, not driness, is the object of taste. I say the tongue must be potentially moist; for if it were actually moist, it could not judge of moistures; for the sense should be void of that which it apprehendeth by sensation; therefore there is no moisture nor relish in the tongue, for when it abounds with moisture, or hath in it any relish, it loseth its taste. 3. The taste hath no external medium as the other three senses, and in this it agreeth with touching. 4. Though savors work materially upon the tongue, yet the act of sensation is by reception of the species, for real qualities cannot be received into the animal spirits, and judged by the common sense and fantasie.

*II.* The sense of tact either hath no medium, or else we must make the skin the medium; and the flesh, membranes and nerves the organ; but indeed the skin is both the organ of tact, as experience shewes; and the medium in respect of the flesh and nerves. 2. The four prime qualities, chiefly heat and cold, are not onely the objects of tact, but agents upon them, by warming and cooling the organs; so are not the second qualities, to wit, hardness, softness, asperity, &c. For these are not active at all, except levity in a spiritual or intentional way. 3. Though there be many particular objects of tact, as the first and second qualities, yet there is but one general object, to wit, the tactile quality. 4. Though this be true, that the sensible object put upon the sense, hindreth sensation, in these senses that have the air for a medium, yet it is not true in the sense of tact, which hath no such medium. 5. The sensitive creature can subsist without any of the five senses except the tact; because this consisteth in the proportion and harmony of the prime qualities, which if it fail, sense also faileth, and consequently animality. 6. Of all creatures, the sense of tact is most exquisit in man, because his body is most temperate; but tact consisteth in the temper of the prime qualities. 7. Though taste be accompanied with tact, yet they are distinct senses both in the organs, media, and faculties; and tact is diffused through all the body, whereas taste is only in the mouth.



## CHAP. XXII.

1. *The use of the common sense: It is but one sense: The different judgement of this sense, and of the soul. How different from other senses. Its in the brain and heart. 2. Imagination or fantasie, what: disturbed compoundeth. The Estimative. Its work and seat. 3. Memory, how a sense. It is twofold. Reminiscence, what? Old men and childrens memories.*

**A**S there be three actions of the soul, to wit, dijudication, composition, and retention, so there are three internal senses; to wit, the common sense, the fantasie and the memory. The common sense apprehends and judgeth the objects of the outward senses, in which, as in the Center all these objects do meet; the eye cannot put difference between colours and smells, but the common sense doth; and though the eye see, yet it doth not know it self to see, that is the work of the common sense; therefore mad men in whom this sense is hurt, see, but perceive it not, nor doe they difference the objects which they see, but either confound them, or mistake the one for the other. So when the sensitive spirits are imployed by the fantasie, though we see oftentimes the object, yet we perceive it not. 2. Though the common sense apprehends diversity of objects, yet it is but one sense, because its actions in judging or differencing these objects is but one: So the eye hath but one action, though it seeth many objects. 3. The act of judging in the common sense, is not that of the soul, which extendeth it self to things also spiritual and universal, and belongs only to man, not to the beasts, as the judging of the common sense doth. 4. The external senses apprehend their objects onely present, but the internal senses apprehend them being absent. 5. The common sense is in the brain subjectively, for there are the animal spirits and nerves, so saith *Galen*; but in the heart originally, and in its cause; for from thence are the vital spirits, which are the matter of the animal, and so is *Aristotle* to be understood.

11. The second internal sense is the imagination, so called from the images or species, which it both receiveth from the common sense, and frameth to it self: If the brain be sound and undisturbed, it receiveth species from the common sense only, and judgeth more distinctly of them then the common sense doth; it compoundeth also and uniteth, and in beasts it serves



in stead of reason to direct them to their operations; in man it is subservient to the intellect in ministring species to it, therefore it is called phantasie, from φαίνεῖν, to shine, or shew; For as the eye discerns its objects by the light, so doth the intellect whilest it is in the body, work and speculate by the phantasie. 2. In disturbed brains by phrensies, fevers, or inordinate sleep, the phantasie makes other objects to its self then were represented to it by the common sense. 3. The phantasie compoundeth that which the common sense apprehendeth in a divided way; as I see a horse and a man, and the common sense apprehendeth the species of both apart; but to conceive them united in a Centaure, is the work of the phantasie. 4. The estimative is not a sense distinct from the phantasie, but the very same, whose office is to esteem what is good or hurtful to the creature, and so to follow or avoid it, therefore this sense stirreth up the appetite. 5. The common sense doth not work but when the outward senses are working; but the phantasie worketh without them, to wit, in sleep. 6. The fore part of the brain, in which is the common sense, is humid, as being fittest for reception, which is the common senses work; the hinder part is dry, as fittest for retention, which is the work of the memory: but the middle part is temperately humid and dry, as fittest for reception and retention, both which are performed by the phantasie. 7. For a right and orderly phantasie, or imagination, there are required clear spirits from vapors, a temperate organ, straight nerves and passages, and a moderate heat from the heart; if any of these bee deficient, the phantasie is disordered.

III. The third internal sense is the memory; not so much to be called a sense, as it retaineth the species; (for in this the nature of sensation consisteth not,) but as it receiveth them, for sensation is properly in reception. 2. This sense is the treasury, in which are laid up that species of things past, which have been apprehended by the external senses. For as these consider things present, and hope things future; so doth the memory, things past: it is the wax receiving and retaining the stamp of the seal, and it is a faculty of the sensitive, not of the intellective soul; for beasts and birds have memories. As for the intellective memory, it is all one with the passive intellect, which is the keeper of the intelligible species; for it belongs to the same faculty to understand and to remember. 3. Though in brutes there is memory, yet recordation or reminiscence is onely in man, because it is joined with discourse and



and deliberation, which are operations of the intellect; for memory is the retention of the species, but reminiscence is a recollecting by discourse and comparing of circumstances, the species which he had forgot; therefore a nimble wit and reminiscence which consisteth in discourse, go together commonly, but seldom a good wit and a good memory: this requiring a dry organ, the other that which is temperately moist. 4. Children have bad retentive memories, because their brains are moist, and old men have bad receptive memories, because their brains are too dry: therefore there is required for memory a brain temperately moist to receive, and temperately dry to retain the species.

*Finis Libri Secundi.*



F 3

Book





## B O O K III.

Of mans rare Infirmities, or  
admirable Diseases.

## CHAP. I.

1. Of Eels voided by a maid, and of other strange generations. 2. A woman voided in three days, six quarts of milk. 3. Of women, who have eat mens flesh. 4. Of women that have lived some years without food. 5. Of one that lived some years without a brain; another without a Spleen. Of one that lived with a knife in her skull. 6. Of some that have swallowed knives, glasses, &c. 7. Of some shot in the forehead, and the bullet found in the hinder part of the skull.

**H**AVING briefly discoursed upon the fabrick, parts, and passages of mans body, I will as briefly touch some rare and extraordinary infirmities, with which the bodies of some men have been molested, and will point at such causes, as I conceive may stand with the grounds of Divinity and Philosophy. As for ordinary diseases, with their causes, symptomes, and cures, I leave to Physitians.

1. I read in *Cornelius Gemma*, in his *Divine characterismes*, l. 2. ca. 1. of a Maid that voided Eels by the stool, which I conceive may proceed from a natural cause: For, if by the heat of the Sun divers forms are educed out of putrified matter, as Eels out of mud, why may not Eels also be generated in mans body by its heat, there being a disposition and preparation in the matter, for reception of such a form. Thus Bees are begot of Calves flesh, Wasps and Hornets of Horses and Asses, and divers sorts



sorts of Worms in our bodies. I have read of a Bird found in an Oyster, which was presented to *Francis* the first of *France*. I will not speak of the Barnecles in the Scottish Seas, begot of old rotten planks of ships; nor of him that had a golden tooth, which if it were not perfect gold, it might in some qualities resemble it; as pins that have been voided in Imposthumes: For stones begot in the bladder and kidneys, and chalk in the joints of gouty bodies, are not so rare.

II. I read in *Martin Wienrich*, in his book of Monsters, of a woman whose milk did so abound, that in the space of two or three days she voided a gallon and an half, of which was made very savory Butter and Cheese. Though this be rare, yet it is no miracle; for that woman abounding much in blood, must also abound in milk: And some Livers are of that constitution and temper, that they sanguifie much more then others; especially in constitutions that are inclined to cold and moisture; for hot and dry bodies have but little blood, and therefore little milk; and where there is much sweet flegm, or rhume it is easily converted into blood.

III. I read divers stories of women with child, who have lusted after, and have eat mens flesh, and for that end have saln violently upon them, and bit them. This is also a disease proceeding of natural causes, as that infirmity of eating chalk, coals, dirt, tar, ashes in maids, and some married women, called by Physicians, *Pica* or *Malacia*, and is caused by the distemper of the phantasie, and soure malignant melancholy humors in the mouth and concavity of the stomach, and impacted in the tunicles of the ventricle, proceeding partly from the suppression of the flowers, whereby the appetite is vitiated, and the phantasie disturbed; and partly from the malignity of the humor, coveting after such things as are like to it in malignity, yet contrary to it in some of the prime qualities, heat, cold, humidity and ficcity; for Nature looks in the contrary quality to finde remedy.

IV. I read of divers maids, one in *Colen*, another in the *Palatinate*, a third in the Diocese of *Spiz*, & divers more, who have lived without meat and drink two or three years together. This indeed may seem strange, yet it is not against nature; for naturally such bodies as have in them little heat, and much humidity, can subsist longer without food, then hot and dry bodies can; as we see in women and old people, who can fast longer then men and youths. And we know, that divers creatures for many moneths together, can subsist without



food : therefore these maids having much adventitious moisture and little heat to waste the radical humidity, might continue a long time without food ; for where there is little deperdition, there needs not much reparation : besides, the moisture of the air is no small help to them.

V. But that is more strange which *Zacutus* in his *Praxis Admiranda*, lib. 1. obs. 4. mentioneth of a Boy, who lived 3 years without a brain : if he had brought an example of one who had lived 3 years without an heart, I should have subscribed to *Galen* against *Aristotle*, that the heart in dignity is inferiour to the brain. But I suppose that he was not altogether without a brain : For that water which was found within the membrans of the skull, when his head was dissected, was doubtlesse his brain converted into water, or else it had some analogy with the brain, by which the heat of the heart was for a while tempered, and the animal spirits generated, but weakly, therefore life could not subsist long in him. So I have read in *Laurentius* or *Parry*, of one who lived many years without a spleen, but there were found some kirkels in the place of the spleene, which supplied its office. As for that woman mentioned by *Zacutus*, Ob. 5. who lived eight years together with the half of a knife in her head, between the skull and *Dura Mater*, doubtlesse that knife touched not the substance of the brain, therefore could be no hindrance to the animal functions.

VI. It is strange, that whereas *Anacreon* was choaked with a Resin stone, yet some, as *Forestus* in his observat. recordeth, l. 15. obs. 24, 25, &c. have swallowed iron, lead, long sticks, glasse, points of knives, and of swords, and other incredible things, without hurt, and have voided them by the stool. This I partly impute to the wideness and capacity of the passages ; and partly to witchcraft, or juggling ; for the eye in such cases is often deluded, although nature sometimes by imposthumes casteth out such stuffe ; for points of knives, and pins, have been this way ejected : and some have perished, and have been choaked, whilst they have in their madness attempted such things. And provident nature hath in some without hurt sent away needles and pinnes by the urine, about which have been found hard crusty stuffe, which was the matter or glassy slime that was gathered about these pins, and baked by the heat of the body.

VII. I have read of a certain Soldier in the Wars of Savoy, Anno Dom. 1589. who was shot in the forehead with a Musquet bullet, he was cured of the wound, but the bullet remained



ned: Afterward falling from a Ladder, whilest he was scaling the walls of a Town, he was stifled in the Ditch, into which he fell; his head being dissected, the bullet was found in the hinder part thereof: But I believe this removal was by the fall; for otherwise it could not have been removed by the heat or spirits of the head.

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CHAP. II.

*Of one who wanted the pericardium. 2. Of hairy hearts. 3. Of one that walked and fought after his heart was wounded. 4. Stones found in the heart. 5. And worms found there. The heart may putrifie, while we are alive. 6. Worms in the brain.*

Columbus in his Anatomy, l. 16. speaks of a young man in Rome, whom he dissected, and in this found that his heart had no Pericardium; the want of which, was doubtlesse the cause of his death; and for want of it, he fell into divers swooning fits, and was often troubled with the Syncope, by reason the heart wanted refrigeration, which it hath from the water in the Pericardium. For some whose Pericardium hath beene but slightly touched by the sword in the wound of the breast, have fallen into swooning fits, cold sweats, with a cessation of the pulse, so needful is this membran, and its water for the heart. Yea, I have read of some hearts quite dried & shrunk to nothing, for want of this water; such was the heart of Casimire, Marquess of Brandenbourg, of whom Melancthon speaketh, l. 1. de anima.

II. I have read of divers hairy hearts, besides those of Leonidas, Aristomenes, and Hermogines, which is also the work of nature; for hairs are produced of fuliginous and grosser excrements of the humours, where the skin is hottest and driest, for hairs seldome grow where the skin is cold and moist; now if these causes be found in the heart, the same effect will be produced there; but this is seldome seen, and in such onely as are of a fierce, truculent and audacious disposition.

III. Ambrose Parry speaks, l. 9. c. 23. of a Gentleman, who in a duel being wounded deeply in the very substance of the heart, did notwithstanding for a good while lay about him with his sword, and walked two hundred paces before he fell down; this is likely enough, for though the heart was wounded, yet the vital blood and spirits, and heat of the heart, which



which did abound in him, did not presently spend, so long as they continued, he lived; when they failed, he fell down dead.

*IV.* What *Wierus* records in his work of Impostures, l. 4.ca. 16. concerning some stones found in the heart of *Maximilian* the second, is not incredible; for the same heat of the body that breeds stones in the bladder, kidney, and joynts, can also produce stones in the heart, if there be the same matter, and disposition for such a production, and this may be the work of nature alone, without forcery.

*V.* Nor is it incredible, what is recorded by divers, of worms found in the heart; which cause consumptions, and strange distempers in our bodies, which oftentimes deceive Physicians. For the heart is no more privileged from worms, then other members, save onely that its substance is hard and solid, and by reason of its spirits and heat, it is not so much subject to putrification, as parts more soft and loose, and consequently not so often infested with worms and imposthumes, as other members are; yet it is not altogether exempted. For I have read of one whose heart being opened, there was found in it a white worm with a sharp beek, which being placed on a table, and a circle of the juice of Garlick made about it, died, being overcome with that strong smell; by which it is plain, that the use of Garlick is wholesome and needful for such as are subject to worms, as being their destroyer.

*VI.* *Fernelius* is deceived, when he saith that the heart doth not putrifie in us whilest we are alive, because it is of a solid and hard substance, and is the last that dieth in us; but it is not more hard and solid, then the bones, which notwithstanding putrifie whilest we are alive; and it is true, that it is the last thing that dieth in us, for it doth not totally putrifie till we be dead, because all the heat, motions, and functions thereof cease not till then.

*VII.* And not onely in the heart, but in the braines also worms are ingendred, as *Avicenna*, *Hollerius*, and others doe witness. And I have read of black and round worms, that by sneezing powder of Castoreum and Pepper have been voided by the nose; and of ear-worms also.



## CHAP. III.

1. *Epilepsie.* 2. *Incubus.* 3. *Vertigo.* 4. *Of a stone in the tongue.*  
 5. *One of nine years old brought to bed.* 6. *Bodies turned to Stones.* 7. *Sleep-walkers.* 8. *Superfetation.* *Ventriloques.*  
 9. *A strange stone found in the matrix.*

**T**He *Epilepsie* and malignant feavers oftentimes end in deafness; and this is held a good signe of recovery; the reason is, because nature thrusts out the malignant humor from the brain into the next passages, which are the ears.

*II.* Some take the night-mare or *Incubus* for a spirit, but indeed it is a feculent humor adhering to the virall parts, and with its black or melancholy fume troubling the Diaphragma, Lungs, and Brain, and distempering the imagination with horrid shapes.

*III.* Nature is very skilfull and provident in helping her self when art faileth; for many diseases have been cured by nature, which the Physicians have been forced to give off. *Zacutus Obs.* 15. mentioneth one who being every month vexed with a terrible *Vertigo*, which for a time made him stupid and senseless, was cured by a flux of blood gushing out of his eyes, without any inflammation at all, or redness of the eyes; by those veins that fed the eyes, nature found out a way to ease her self, which veins were opened by the violent motion of the spirits in the head, and the abundance of blood pressing into those veins, which made an eruption.

*IV.* And it is no less strange what he records, *Obs.* 72. of one, upon the tip of whose tongue was found a stone as big as a filbert nut, which grew there within a swelling caused by a great flux, doubtless of slimy matter into that part, and baked into that consistence by a preternatural heat; for he was much subject to Catharrs.

*V.* That is not incredible which is recorded by *Faubert* in his *Vulgar Errors*, l. 2. c. 2. of young women, who have been brought to bed at nine or ten years of age, for nature is more pregnant and forward in some then in others; this we see in some trees, and other vegetables; but these women give off child-bearing berimes, to wit, about one or two and twenty: for, [*quod cito fit cito perit*] and as we say, soon ripe, soon rotten; for such hasty and precipitate works of nature are not permanent: hence it is that women who sooner attain to their growth



growth then men, decay sooner then men.

VI. For stones to be bred in the Lungs, which are oftentimes the causes of drie coughs, is no great wonder, for divers times such stones have been voided by coughing: but for a mans body to be converted into a stone, as is Recorded in the memorials of *Lyons in France*, is more strange, yet not impossible, and therefore the conversion of *Lots wife* into a Salt Pillar is not incredible, although this was the sole work of God. Neither is that incredible which is written of the lake that turns the sticks cast into it, into stones: nor that Cave in *Scotland*, where the water-drops are turned to stones; I have kept an apple til it grew to that hardness, that no wood could be harder, nor scarce could a knife cut it. I wil not say this was a perfect stone into which this body was thus turned, but it might be as hard and drie as a stone; for the bodies that are found in the sands of *Egypt*, are very dry and hard.

VII. *Horstius*, and others record divers examples of sleep-walkers, who do strange things in their sleep; but this is also the work of nature; for I finde that they are most subject to this infirmity, whose animal spirits are most active, subtil and fiery; and whose imagination is strong; so that by the strength of their fantasie, and agility of their spirits, the muscles are moved, though the Will doth not then concur to this motion, nor reason make any opposition, which it would do if they were naked, and not suffer them to undergo such dangers.

VIII. I have read divers Stories of women who have had seaven children and more at a birth, and likewise of superfetation; both which are credible, and possible in nature, as I have shewed in the former book, c. 13. sect. 5. & 7. But that the infant should crie in the mothers womb, as some have done, is more strange; seeing it doth not breath, neither is there any air in the matrix, without which there can be no sound; therefore either this crie was imaginary in the party that heard it, for sometimes we think we hear a sound when we hear none; or else this sound might proceed from wind in the mothers womb, which might resemble the crying of a child, or else these mothers might be ventriloque.

IX. That may seem a miracle which is recorded by Monsieur *John Alibaux* a Physician, of a woman of *Sens in Bourgundie* which went 28 years with a dead child in her womb; this woman being dead, and her belly opened, there was found a stone having all the limbs and proportion of a child of 9 months old. This was no miracle, but an extraordinary work of nature; for



for the child being dead, and the slimie matter of its body having an aptitude by the extraordinary heat of the matrix to be hardned, might retain the same lineaments which it had before; If any wonder, how within the soft and liquid humors of the matrix, such a hard substance should be ingendred; let him as well wonder at the generation of hard bones within soft flesh, of hard stones within soft plums, Peaches, and other fruits, of stones and hard thunder-bolts within watrish clouds.

CHAP. IV.

1. *Some without Lungs.* 2. *Impostumes voided in Urine.* 3. *Worms the cause of many diseases.* 4. *No change of sexes.* 5. *Giants.* 6. *Some without livers.* 7. *Fleshy bladders.* 8. *Stones, haire,* worms, &c. Begot in our Urine. 9. *A woman without a matrix.*

I Have read of divers bodies of men without lungs, and I believe it; for oftentimes the lungs are putrified and corroded with corrupt and acrimonious matter, and wasted with burning heat; but hence it will not follow, that a man can live without lungs any time, seeing the heart stands in need continually of refrigeration; yet some do live a great while with half of the lungs, after the other half is putrified and spit out.

II. I finde that when impostumations and corrupted matter in the breast cannot be evacuated by spitting, or coughing, or vomiting, or by Phlebotomy, or the stool, it is notwithstanding purged out by urine, naturally, without the help of art; by which we see, how cunning and industrious nature is to help her self, and that she is more carefull to thrust out noxious, then to draw in profitable things, hence sick mens expiration is stronger then their inspiration: and hence also we see that there are many porous and pervious passages unknown to us, which doubtless are in our bodies being alive, which cannot be found being dead, because shut by the cold.

III. I finde that many Physitians are mistaken in the causes of divers diseases, and therefore their remedies prove oftentimes fruitless, or hurtfull: For I have known Apoplexies, Convulsions, Coughs, Consumptions, Feavers, Cholicks, and other Diseases proceed from Wormes, which when they have beene voided, either dead or alive, the



the sick partys have recovered : Nay , I have read of some who have had worms crawl out at their navels : and some whose organs of voice and speech having been assaulted and hurt by worms, have become speechless ; how carefull then should we be of our diets, not to delight so much as we do in sweet meats, fauces , and drinks , or in such food as breeds slimy matter, whereof worms are ingendred : and Physitians should be as carefull to prescribe such things to their patients , as may kill and evacuate these enemies of our health and life.

IV. That maids have become boyes , I have read in divers Stories: but I have shewed in the former Book, that there is no such change in nature, because the organs of generation in the two sexes, differ, both in number, form, and situation: and that therefore such transformations are meant of Hermaphrodites, or of such boyes, in whom the vessels of generation have not at first appeared outwardly for want of heat and strength , which afterwards have thrust them out. Dr. Brown admits the change , and yet shews that the vessels are different , both in form and situation , which is a contradiction.

V. That there have been Giants , and men of stupendious stature in all ages, is not to be doubted, seeing there are so many witnesses extant : and the reason of their bigness can be none else, but the abundance of seed and menstruous blood of which they are begot , the quality and pliability of the matter, apt to be extended, the strength also of the heat and formative power : and that these men should have rapacious stomachs to devour incredible quantities of meat and drink, is not to be wondred at, if we consider the bulk of their bodies, the capacity of their stomachs, and rapacity of their heat.

VI. Nature is not deficient in necessities , nor abundant in superfluities , there is not any one member in our bodies that can be spared : for if there be any one defective, our life proves short and miserable. I have read of some who have been found without Livers , but such had a fleshy lump in stead thereof , which not being able to sanguifie , or turn the Chylus into blood, the parties lived but a short while, and died of Tympanies or Hydropsies ; and others whose Livers have been found full of stones , have died of the same disease ; and so have those whose spleen hath been found stony. A woman who died of an Hydropsie, I saw dissected, whose spleen was full of stones, of a blewish and green colour.

VII. Not onely are stones of great bigness bred in the bladder,



der, by which the passage of the urine is intercepted, and so death and many tortures are procured; but also there have been found in some bladders, great lumps of flesh, yea all the internal side of the bladder filled up with fleshy excrescences, that there could be no room for the urine; but I doubt whether this were true flesh or not, seeing no flesh is begot but of blood; I think therefore that this was an excrementitious substance resembling flesh in colour and shape.

VIII. It is manifest that some with their urine evacuate stones, gravel, matter, hairs, little crawling creatures of divers shapes, which doubtless are begotten of putrefaction, according to the disposition of the matter, and heat of the bladder, or kidneys; if the matter be adust and burned, hairs are begot sometimes as big as hogs bristles: and sometimes the stones of the kidneys are so big that they stick in the yard, and cannot be evacuated without incision; upon the stoppage of the urine by these stones, malignant vapours ascend from the corrupted urine into the noble parts, that convulsions, synopes, and other dangerous effects are procreated.

IX. As a man can live without testicles, so can a woman, without the matrix, these being members given by nature not for conversation of the individuals, but for continuation of the species: Therefore *Zacutus* speaks of a woman who lived thirty years after her matrix was cut out; which by a fall that she had from a high tree, had slipped out of its place, and could never be again replaced. *Obs.* 76. l. 2.

#### CHAP. V.

1. Strange but not miraculous births. 2. Strange and strong imaginations. 3. Poison inward and outward. 4. Poison of mad Dogs. 5. *Cantharides*. 6. Poison how it worketh. 7. Why birds not poisoned as men. 8. *Amphiam*, *Opium*, *Mandrakes*. 9. The Plague no *Hectick* nor putrid Fever. 10. Epidemical diseases.

**T**Hat a boy of nine years old should beget a child, is rare, but much more strange it is that a child should be born with all his teeth, and another with a long beard, yet such have been: and these are but the effects of nature, which though in her ordinary course she observes a time for the growth, perfection, and decay of things: yet sometimes she is furthered and hindred, according as the matter is disposed, the



the heat proportioned, and her instruments fitted : Why should not Nature have the same priviledge that Art hath; but we see that hearbs and fruits can be produced and perfected before their time, by the Art of man, therefore such works are meerly natural, not miraculous: for sublunary bodies are not like the celestial, which are not subject to alteration, but still keep the same constant tenor.

II. What force the imagination hath in women, to make impressions of the things imagined on the tender infant in the womb, is known by many Stories, and daily Examples : Hence it is that so many children are born with such variety of strange shapes and marks. Besides, we know how forcible the phantasie is, both in curing and procuring of diseases; yea, oftentimes of death. Thus one having eat of a Rabbit pie, imagining she had eat of a cat, fel a vomiting and died. Another having passed over a dangerous bridge in the dark, and returning the next day to look upon the place, was struck with such an horror, that he went home and died. A third being in jest made believe that he must lose his head, swooned and fel down dead. Multitudes of such Examples there are; but the imaginations which proceed from hypochondriacal melancholy, are most strange, whereby one supposeth himself to be dead, therefore will not eat. Another is perswaded that he hath never a head. A third, that his breech is made of glass, therefore will not sit down for fear of breaking. Another thinks the heaven will fall upon him, therefore must have a Target born over him. Another wil not piss for fear he should drown the world : And many more such strange conceits are some men troubled with by reason of their imaginations which are distorted by the black and malignant fumes that disturb the animal spirits, subservient to the phantasie. Such are the imaginations of those who think themselves wolves, and therefore run into the woods, and bite men and cattel they meet with. I have read of one who thought himself to be a cock, and therefore fel to crowing. And doubtless the Lycanthropie so much spoken of, is nothing else but the strength of a distemper'd imagination, whatsoe'r *Bodin* writes to the contrary.

III. The cause of many extraordinary distempers in us, is poyson, whether internal, bred within our selves by the corruption or putrefaction of the seed, blood, or humors of our bodies, by which pestilent and venomous fumes assault the heart and brains : or external, as the biting of mad dogs, or cats, or other creatures : For I have read of some that never were bitten, and yet have beene subject to the same kinde of raging and  
fury



fury that they are who are bit by mad dogs; but their fits were milder, because the constitution of dogs is more melancholy then that of mans, therefore their venom more dangerous; and who would think there were such poyson in a mad cook, who being angred, struck one in the hand with his becke, upon which blow the man fell distracted and died, neither could any physick cure him.

IV. The madness that is caused by the biting of mad dogs, is not in all men alike, but upon some the poyson worketh sooner, upon some later, according to the degree of madness in the dog, or the deepness of the wound, or disposition of the body wounded: for foul bodies, melancholick and cholerick constitutions are aptest to receive the venom; therefore in some the poyson appeareth quickly, in others not in a long time, to wit, not in a year, or more; for the malignity doth not presently assault the spirits, heart and brains. And *Capivaccus* observes, that this poyson is of a fiery quality, and hot in the fourth degree, as he sheweth by one who was thus bit; his body being opened, there was found no water in his *Pericardium*, but a part of it was burned up, and being touched, fell into ashes; the ventricles also were dried up, and had no blood at all.

V. It is strange that some do piss blood upon the applying of the Flyes called *Cantharides* to the neck, hands, or feet, so remote from the bladder: by this we see that the malignant vertue of these flies, hath a particular influence upon that member. This action of the bladder cannot be by the first or second qualities of the *Cantharides*: for then they should work first upon the next members: therefore this action must be performed by an occult quality, of the specifical form of the flie. And much more strange is it, that the body of this flie should be poyson, and the wings thereof a counterpoyson, which in the living fly are at concord, by reason of the specifical form or soul of the fly ruling all the parts, and keeping them in unity; but when that is gon in the dead fly, the one part destroys the other. Who can give exact reasons of Natures secrets?

VI. And no less strange is it, that *Euphorbium* and *Mustard* are equally hot, to wit, in the fourth degree, and yet the one is poyson, not the other; and *Treacle* which is hot in the first degree, heats more then *Pepper* which is hot in the fourth degree; this shews that the form of the one is not so active as the form of the other; and therefore four times so much heat in



the one, is not so prevalent as one degree of heat in the other; which shewes that poysons do not work by their temper which consist of elementary qualities, but by their substance or form, whose qualities are occult to us.

VII. Why *Napellus*, or Wolfe-bane, *Hyosciamus*, or Henbane, and other hearbs which are poyson to man, are nutriment to birds, can have no other reason, but that birds have a greater heat in their stomachs to subdue the malignity of these hearbs to send away the noxious and excrementitious part, and to convert the rest into their own substance, which substance notwithstanding is not poysonable to man, because the poyson was consumed by the heat of the bird. Now the heat of mans stomach is more temperate, and therefore less able to master such malignant hearbs; yet *Scaliger* (*Exerc. 175. 1.*) speaks of a man who was fed with poyson from his infancy, whose flesh at last became so venomous, that the flies which sucked his blood swelled and died.

VIII. That *Amphiam*, or *Opium*, should stir up venery, and cause a tickling in the skin, and yet stupifie the members, and cast them into a dead sleep, is not without admiration; but doubtless either the *Amphiam*, or *Opium*, are different, that being made of the white, this of the black Poppies, or else in the *Opium* there be different substances, the one being very cold, which causeth stupidity; the other very hot, by causing a tickling in the skin: which heat is also perceived by its bitterness; but cold is most predominant, or else we may say that it excites venery accidentally, by temperating the excessive heat of the body, which is an enemy to *Venus*: The like effect is wrought by Mandrakes, which perhaps was the cause that *Rachel* so much desired them. Nor must we think it strange that the *Opium* produceth contrary effects; for we know that the same Rose in some part of it hath a sliptick, in other parts a laxative quality.

IX. The plague to which our bodies are subject, is an occult poyson, killing us by the breath or touch, and not an Heftick Feaver, because this drieth and burneth up the heart by degrees, the plague kills suddenly. 2. The Heftick is not infectious, as this. 3. In a confirmed Heftick there is no recovery, in the Plague divers recover: nor is the pestilence a putrid Feaver, because, 1. the pulse is more remiss, the urine clearer, the head-ach, thirst, and agitation of the body less in the plague than in a putrid Feaver. 2. Because a pestilential feaver follows upon a putrid, so that when this is gon, that begins.

Tridemical



X. Epidemical diseases, whereof pestilential are the most pernicious, are conveyed to us by the air, which we are continually attracting to the heart and brains, 1. either when the air is infected with the impression of malignant and occult qualities from the influence of the Stars, or, 2. when it is poisoned with putrified, corrupt, and pernicious vapours exhaled out of pits, caves, dirches, putrified lakes, &c. Or, 3. When the prime qualities of the air, to wit, heat, cold, &c. are intensive beyond ordinary; but we must not think that the substance of the air is at any time putrified: for being a simple body, it is not subject to putrification.

## CHAP. VI.

1. Antipathies to some meats. 2. The force of Fear. 3. Blood voided by the Gums and Navil. 4. Black hairs suddenly gray. 5. Violence of passions. 6. Defects in nature recompensed. 7. A Fly voided by Urine. 8. Monethly bloud in men. 9. The causes of Monsters. 10. Horns on mens heads and heels.

AS there are divers temperaments of men, so there are divers sympathies and antipathies to certain meats and drinks: some cannot indure the sight or smell of Cheese, others abhor eggs, others flesh, others bread, some cannot abide wine, others abhor piggs, and all kinde of swines flesh, many cannot endure the smell of apples, others detest all kind of sweet meats; and which is most strange, that the smell of Roses so pleasing to most men, is odious and deadly to others. Cardinal Carafa during the time of Roses, used to inclose himself in a Chamber, not permitting any to come near him that had Roses, as *Wierus Valerian* shews in his Hieroglyphicks, the smell of a Rose would cause a certain Jacobin swoun, and be like a dead man, as *Amatus Lusitanus* recordeth in his second Centurie; the like is written of divers others. This must either proceed from an occult quality, or from the distemper of the phantasie and prejudicate opinion that some have of such things, that they are hurtful to them; or else it is in some an hereditary infirmity proceeding from the parents: for *Forestus* writes, that in a certain family the sons could not eat Cheese, but the daughters could eat it with a good appetite, because



the mother did love Cheefe, but the father could not abide it. See his Annotations on the fifth Observation, lib. 4.

II. Fear is more powerfull in curing of diseases, then any Physitians in the world: for *Zacutus* l.2. *Obs.* 86. speaks of a woman whose matrix had fallen, and hung out of its place two years together, neither could any Physick or Art replace it again, till a sudden fear attracted it, she feeling the mice running up her thighs, which she had purposely (holding them by a thread) let run towards the part; the matrix suddenly slipped into its own place again.

III. Nature is more skilfull then any Physitian to cure her self; and if she cannot finde a way for evacuation of her superfluities, she will with *Hannibal* make a way, though it be through Rocks: for he shewes that the ordinary passage of the menstruous blood being stopped in a certain woman, Nature made her a passage through the gums, out of which monthly for two days together great store of blood was voided. He speaks of another who on the like occasion had a vent for the blood through the navel, lib.2. *Obs.* 91, 92.

IV. That black hairs should become suddenly white, may to some seem incredible; yet we have stories of this sudden change. *Scaliger* (*Exercit.* 212.) tells us of one *Francis Gonzaga*, who being imprisoned upon suspicion of treason, in one night his black hair turned white. *Vives* in his Preface on *Scipio's Dream*, and *Hadrian Junius* in *Comment. de Coma.* c. 10. speaks of a young Spanish Gentleman, who in a night became as white as one of 80 years old, *Calvus Rodiginus* in his 13 Book *Antiq. l. 8.* speaks of another who searched after young Hawkes upon a high steep Rock, and fearing the rope would break with which he was held, became instantly white. Divers other examples I could alledg, but these are sufficient to let us see that the change of our hairs which is perform'd by nature in space of time ordinarily, is upon an extraordinary fear effected suddenly in some; the roots of the hairs being deprived of that heat and radical moisture between the flesh and skin of the head, by which they were fed, the spirits and blood flying suddenly to the heart, leave the other parts destitute. This we see in trees, when blasted with a piercing cold wind, their leaves suddenly change colour, and of green become yellow, their naturall heat and moisture being extinguished and dried up.

V. There is no passion in our bodies more violent then fear, which distempers the fantasie, troubles the other senses,



ses, causeth our hairs to stand an end, makes us dumb; all which the Prince of Poets expressed in one verse: *Obstupui, steteruntq; comæ, & vox faucibus hæsit*; and indeed the fear of death, hath upon some brought sudden death: the spirits, heat, and blood, flying suddenly to the heart, by which this is oppressed, and the senses left destitute. Others by sudden fear have lost their judgement, and become distracted; strange effects also are produced in us by excessive anger, and joy; so that some have suddenly died, with immediate anger, and excessive joy, the spirits and heat flying suddenly from the heart, into the exterior parts, by which means syncopes, swoundings, and death follow: As I could instance in many examples.

V I. I observe that where Nature is defective in one part, there is a recompence made; for they who are born blind, exceed us in memory; and they who are born deaf and dumb, excell us in apprehension; they who are born without hands or arms, perform with their feet, what we do by our hands. *Phil. Camerarius* in his Historical meditations, c. 37. speaks of one who could make pens and write with his toes, cut, carve, and feed himself, as well as we with our hands, but his toes were longer then ordinary, and proportioned like our fingers: *Montague* in his Essays, l. 1. c. 22. writes of another, who with his toes could discharge a Pistol, take off his hat, play at cards and dice, and handle his sword as well as we with our hands, by which we see how custom becomes another nature.

V I I. Though it be rare, yet it is natural for a fly to be ingendred in mans body, the mater being disposed to receive that form; for *Zacutus, Obs.* 101. writes of one who being pained in his yard, at last voided a fly by his urine.

V I I I. As there be some masculin women, so there are some feminate men; such was he who from twenty to forty five, had his monthly vacuation of blood, as women have; by which it seems his constitution was altogether feminine, moist and cold; therefore was smooth skinned, having no Beard, nor hair at all on his body. *Zacut. Obs.* 102. l. 2. *prax. mir.*

I X. Of the many moustinous shapes which are begot of women, We may read in *Winrichius*, *Parrie*, *Rumelinus*, *Levinus*, *Lemnius*, and divers other Physitians, Phylosophers and Historians, whose Testimonies and Examples I alledge not, because I would be brief: the



cause of these Monsters cannot be the mothers imagination, as most think; for the imagination makes not impression on the Embryo, but of such things as the mother earnestly desires; as she that lusterh earnestly for a rose, which having with much difficulty got, (for it was not rose time) she greedily smelled to it, and laid it up in her bosome; upon which, the impression of a rose was made in the childs skin. But what mother will lust to have a child with a dogs head, or of any other monstrous shape, seeing they abhor such conceptions? Therefore such monstrous shapes are the effects of the formative faculty in the seed, which if it be peccant either in quantity or quality, or if there be any fault in the place of conception, or in the menstruous blood of the mother, then the formative aiming at the specifical shape, but missing of it by reason of these impediments, rather then it should be idle, and do nothing, it brings in the generical form of an animal, either perfect or imperfect, as the matter is disposed; though I denie not the influence of the heavens; but this is only a remote and universal cause.

X. I have read of one who had a horn grew upon his heel a foot long, which being cut off, did grow again; and doubtless would have still renewed, if the rough and viscus matter which fed it, had not been diverted and evacuated by issues, purges, and phlebotomy; for when Nature hath found a passage for evacuation, thither she sends the superfluties. But more strange it is that children should be born with horns on their heads. Of such I have read. *Hildanus* writes that he saw a man on whose head grew a horn, crooked like a rams horn; in his *Chirurgical observations Gent. 2. Obs. 25.* The story therefore of *Jupiter Amon*, may not be incredible.

## CHAP. VII.

1. The effects of bloud being drunk. 2. Some strange diseases. 3. *Plica Polonica.* 4. Some eat poison without hurt. 5. Stones in the Intestinas. 6. Old men become young. 7. Some strange monsters.

I Have read of one who was poisoned with drinking bulls blood; of another who grew mad by drinking of mans blood, of a third who by drinking of his wifes monthly blood, was enamoured with his own wife, that he hated in respect of her, all other women; some from hence have concluded, that there is poison in these creatures blood, but I am not of their minde.



minde; for doubtlesse if the flesh of these creatures be sound and wholesome, the blood out of which the flesh is made, cannot be venomous. 2. The blood of a Bull is grosse, fibrous, stopping, and hard of concoction, and so to weak stomachs may prove accidentally hurtful or deadly, but not to a strong stomach. 3. It may kill even a strong body, if it be taken in too great a quantity, and so may any meat, and the best wines in this respect prove poisonable. 4. If mans blood were poisonable, then *Catalin* and his companions had been poisoned, when they dranke mans blood at the taking of their solemne Covenant against the State, as *Salust* shews. Then *Polyphemus* had been poisoned by *Ulysses*'s fellows, *Dum visceribus miserorum & sanguine vescitur atro*. What will become of the Canibals? 5. The menstruous blood of women, is as sound as any other blood in the veins, if the body be sound: but if it be imperfect or corrupted with malignant humours, it may be poisonable; but I deny, that there is any such vertue in blood, as to procure love; this may be an illusion of Satan, who delights in blood.

*II.* Strange are the diseases that some bodies are subject too; I have heard of one who being troubled with a burning fever, had his veins opened, out of which with the blood there slipt out a worm of a foot long: another had a red spot, which did rise in his foot the bredth and colour of a red rose, which did now and then remove from one place to another; and in what place soever it was, caused an intolerable burning, which could be nothing elf but a scalding blood carried up and down by hot and fiery spirits; of these two *Zacutus* speaks, *l. 3.* and of a third whose skin grew as hard and rugged as the bark of a Tree.

*III.* Some uncouth and strange diseases have appeared in this latter age of the world, not heard of heretofore; one is mentioned by *Rodoric. Fonseca, conf. 1.* in his consultations, called *Plica Polonica*, because in *Poland* it rageth most; this disease suddenly weakneth the body, curleth the hairs of the head, and intangleth them so, that they represent the shape of snakes, and being pricked drop with blood, and swarm with lice, and make a loathsome smell. This disease proceeds doubtless from the corruption of the aire, the grosseness of the diet, their frequenting of close stoves, the infection of the blood, and the abundance of viscous humours, and grosse vapours which nature sends to the skin of the head, and so the hairs. I will not speak here of the Scurvy, the French disease, the English



sweat, and others too well known among us.

IV. Strange is the variety of tempers and constitutions among men; *Arnoldus de villa nova in specula*, c. 77, speaks of a maid who familiarly did eat spiders, which sheweth, that either spiders are not venomous, or else her body was of the same temper that Monkeys are, who eat spiders. But that is more strange which is mentioned by *Galen*, l. 3. c. 18. *Simpl.* Of an old woman that ate Henbane plentifully, without hurt; it seems she had the stomach of swallows, which feed upon this poisonous weed. I have read of some that have eaten Scammony, others Opium, others Hellebor, and of some that without hurt have swallowed quick-silver; that must be attributed to their particular tempers, and strength of heat by which they mastered these poisons.

V. As stones are ingendred in the kidneys, bladder, and other parts, so are they also sometimes bred in our intestins, for there are some that void stones familiarly by the stool: and I have read of one who was killed by a stone that grew & stuck fast to his colon, the bignesse of a chest-nut; this sure must proceed from the extraordinary heat of the intestins, and viscidous matter impacted there; for the heat baked the matter to the consistence and hardnesse of a stone, by drying up the watrish moisture thereof.

VI. I have read of some old men and women, that have become young again: that is to say, after they had lost their teeth, strength, and beauty, have recovered all at 80 or 100 years of age; their veins filled with blood, new teeth, a fresh colour, their white haire turned black, and in women their monethly flowers fresh and orderly. This is not unlikely; for if after a fever, or other great sickness, nature recovers her lost beauty, vigour, colour, and decayed spirits and senses, why may not she doe the like in some people, seeing there is not in old age, a total privation of these perfections there, but a decay; and we may observe, that many who are old, weak and sickly, when they are young, are young, lusty, and healthy, when they grow old.

VII. I have read of men that have had milk in their breasts, which is likely, if they were of a cold, moist, and feminine complexion, abounding in blood; of women also who have had four breasts, all full of milk: which is probable, seeing there be many monsters, that have superfluous members, according to the superabundance of the parents seed and prolificall blood; but of all monsters, that which is mentioned by *Buchanan*



*chanan* in his History of Scotland, is most wonderful, which had beneath the navel, one body, but above two bodies; when it was hurt beneath the navel, both bodies felt the pain; if hurt above, the body felt only that was hurt: These two would sometimes differ in opinions and quarrel, the one dying before the other; this pined away by degrees, it lived 28 years, could speak divers languages, and were by the Kings command taught Musick. Doubtlesse nature aimed at twins, but failed in the lower part. Neither was this one *Individuum*, but two, because they were two souls, as appears by their different wills; and it is the form, nor the matter that is the cause of individuation.

CHAP. VIII.

1. Of divers and strange spleens. 2. Black urine. 3. One lived without sleep. 4. The Tarentula's effects and cure. The force of Musick. 5. Serpents begot of dead brains. 6. Of Tiberius his sight, Alexanders sweat. Strabo's eyes.

**F***Allopius* in his Anatomical Observations, (l. 1. 6.) writes, that he hath found three Spleens in one man, *Gemma* in his *Cosmocrutick* speaks of two Spleens that he found; and hee writes of one who had the Spleen in the right side, and the Liver in the left, in l. 1. *Cyclognomonick*, p. 75. Some have Spleens of incredible bignesse and weight: others have them fastned to their breasts: others loose and swimming up and down: others again have had no Spleen at all, and such have died of the black jaundice: for the blood and skin could not but bee infected with that melancholy humour, wanting the Spleen, which is the proper receptacle of it.

*II.* For a man in a burning fever, or one that is oppressed with melancholy humours, to void black urine, is no wonder; but for one that is sound all the days of his life, to pisse black urine, as *Petræus* sheweth, is somewhat strange, *Disput. 5. de urinis*, num. 22. But doubtless the constitution of that man was melancholick: for the black colour in any thing, is caused by the predominancy of earth: therefore *ater quasi à terra*: And earth is most predominant in melancholick tempers; besides, the watrinesse of natural heat may be the cause of black Urine.

*III.* Whereas the animal spirits and strength of our bodies are wasted by watching; therefore sleep is ordained  
to



to repair and refresh the decayed strength and spirits. Yet *Fernelius* (in his *Pathology*, lib. 5. c. 2.) speaks of one who lived without sleep 14 moneths. But this man was possessed with madnesse, whose brain being heated with adust melancholy, did beget animal spirits without much wasting of them. Thus we see that hot and cholerick constitutions can endure longer without sleep, then cold and moist complexions.

IV. The effects of the *Tarentula* in mens bodies are strange and various, and no lesse strange is the cure: for their sting and poison cause some to laugh, some to weep, some drowsie and stupid, and some jovial and merry: These divers effects must proceed from the diversities of poison that is in them: for it seems these venomous creatures are not all of one kind; or else these doe proceed from the different constitutions and tempers of those men that are stung with them: Thus we see what different effects drunkennesse doth cause in men, and so doth musick; but whether this poisonable humour be cured by the musick, or by their dancing, and labour, by which the pores are opened, and the poison by sweat expelled, is questionable; but I think by both; for even in musick, there is great power over the minde and affections, and consequently over the diseases and humours, which are mitigated or exasperated according to the minde and affections. This we see in *Sauls* melancholy, which was cured by *Dauids* Harp. Such force there was in *Timothy* the *Milesian*, that when he pleased he could by the power of his musick, make *Alexander* take up and lay downe Arms. Not to speak of that *Dane*, who by his musick could make men mild, sad, and merry at his pleasure.

V. That a Serpent should bee ingendred of a dead mans brain, is no more impossible then for Snakes or Eels to be begot of Horse hairs; or for divers sorts of beasts to breed in women upon depraved conceptions. And doubtlesse as Satan in the form of a Serpent, brought mortality upon mankind, so he doth sometimes triumph in that shape over mans mortality; God in his judgement permitting sometimes that dead brain to be turned into a Serpent, which when it was alive, did hatch so many Serpentine plots and imaginations.

VI. I read in *Suetonius*, that *Tiberius* the Emperour could see perfectly in the dark. And *Curtius* writes, that *Alexander* did smell sweetly when he sweat. I have read of men and women who can fascinate and hurt others with their eyes. *Pliny* and *Saturnus* write of one *Strabo*, who from a Promontory in Sicily, could see the ships that went out of the Harbour at Carthage,



thage, which is 55 Leagues. These are strange and rare privileges, in which God doth manifest his power, and sheweth, that he is not tied to the Laws of nature. Yet there is no necessity, that we should call these miracles: for as it is no miracle for a Cat to see in the dark, nor for a musk-Cats sweat to smell sweetly, nor for a Basilisk to kill with his eye, or rather with the poisonous vapour of his eye or breath of his mouth; nor is it a miracle for an Eagle or Raven to see at such a distance; these effects flowing from the natural temper and constitution of these creatures, of which temper might these men now mentioned be. I could alledge many other strange qualities of men, as of one who could move his ears like an Horse, of another whose spittle was poison, and of one who never laughed, &c. but these are sufficient to let us see the power and wisdom of God, and the dexterity of his Hand-maid Nature, both in the fabrick and divers temperaments of mens bodies.

FINIS.







## The Second BOOK.

### Of the strange Diseases and Accidents of MANS BODY;

Wherein divers of Dr. *Browns* vulgar  
errors and assertions are refuted, and the  
ancient Tenents maintained:

#### CHAP. I.

1. Divers ways to resist burning.
2. Locust eaters, the lowsie disease, the Baptists fed not on Locusts.
3. Mans flesh most subject to putrifaction, and the causes thereof; How putrifaction is resisted. Mummia.
4. The strength of affection and imagination in dying men. Strange presages of death.
5. Difference of dead mens skulls, and why.

**T**HAT some mens bodies have endured the fire without pain and burning, is not more strange then true; which may be done three manner of ways: 1. By divine power, as the bodies of *Shadrach*, *Meshech*, and *Abednego*, received no hurt or detriment in the fiery furnace. 2. By a Diabolick skill; so the Idolatrous Priests among the Gentiles, used in some solemn sacrifices to walk securely upon burning coals, as the Prince of Poets shews. *Æn. lib. 11.*

———*Medium freri pietate per ignem,  
Cultores multa premimus vestigia pruna.*

And as the men in the Sacrifices of *Apollo*, so women in the Sacrifices of *Diana*, used to walk upon burning coals, as *Strabo* witnesseth, *lib. 12.* Of this custome *Horace* also speaks, (*Hor. 1. Od. 1.* *Incedis per ignes suppositos cineri doloso.* So *Propertius*

[*Pro.*



[*Pro. El. 5. l. 1.*] *Et miser ignotos vestigia ferre per ignes.* And so it was used as a Proverb, *αὐτὸς ἐγὼν ἐπὶ καλίνῳ*, to walk upon coals when a man undertook any dangerous businesse. The Scripture also sheweth, that the Gentiles used to make their sons and daughters passe through the fire: They used also in swearing, to take a burning Iron in their hands without hurt, as *Deliro* sheweth in his Magick. *Pliny* and *Sueton* write, that *Pyrrhus* his thumb, and *Germanicus* his heart, could not be burned. 3. The body is made sometimes to resist fire by natural means, as by unguents; so those *Hirpiæ*, or *Hirpini* in *Italy*, of whom *Pliny*, *Varro*, and others make mention, used to anoint the soles of their feet with this unguent, that they might walk on the fire. *Busbequius* [*Epist. 4.*] was an eye-witnesse at *Constantinople*, of what was done in this kind by a Turkish Monk, who after dinner took an hot burning iron out of the fire, held it in his hand, and thrust it in his mouth, so that his spittle did hisse, without any hurt; whereas one of *Busbequius* his men, thinking this Monk had onely deluded the eye, takes the same iron in his hand, which so burned his palm and fingers, that he could not be healed again in many days. This was done by the Monk, saith *Busbequius*, after he had put some thing in his mouth when he went forth into the Court, pretending it was to seek a stone. The same Authour witnesseth, that he saw at *Venice* one who washed his hands in scalding lead; and why may not the body be made to resist the fire, as well as that kind of *Linum*, called therefore *Asbetinum*, by the Greeks, and *Linum vivum* by the Latines, [*Pancerol. de Lin. vivo.*] in which they used to wrap their Emperours bodies when they buried them, that their ashes might not be mingled with the ashes of their fire; this *Linum* being incombustible. The Salamander also liveth sometime in the fire, though not so long as some have thought. [*Pyrausæ* are gendred in the fire; So *Aristotle* and *Scaliger.*] Nor must we think it fabulous (as *Dr. Brown* too magisterially concludes, *Of Errors, 7. Book c. 18.*) What is written of the *Spartan* Lad, and of *Scævola*, the Roman, who burned their hands without shrinking; he doubts of the truth of this, and yet makes no doubt of that which is more unlikely, to wit, of *Saint Johns* being in the Chaldron of scalding oyl without any hurt at all. [*Book 7. c. 10.*] he that will question the truth of *Scævola's* burning his hand, and of *Curtius*, leaping into the burning gulf, may as well question the broiling of *Saint Lawrence* on the Grediron, or the singing and rejoycing of other Martyrs in the midst of their flames.

II. That



II. That in *Ethiopia* there is a people whose sole food are locusts, is witnessed by *Diodorus* and *Strabo*, [l. 4. c. 16.] these from their food are called *Acridophagi*; they are a lean people, shorter and blacker then others; they are short lived, for the longest life among them exceedeth not 40 years: Their Country affordeth neither fish nor flesh, but God provides them locusts every Spring, which in multitudes are carried to them from the Desert by the West and South-west winds: these they take and salt for their use. These wretched people die all of one disease, much like our lousie sickness: A little before their death, their bodies grow scabby and itchy, so that with scratching, bloody matter and ugly lice of divers shapes, with wings, swarm out of their belly first, then from other parts, so that they pine away and die in great pain. This disease doubtlesse proceeds partly from the corruption of the aire, and partly from the unwholesomnesse of their diet, which turns to putrid humours in their bodies, whence the disease is Epidemical. This vermin breeds most in those who are given to sweat, to nastinesse, and abound with putrified humours, between the flesh and skin, whose constitutions are hot & moist, as children; and according as either of the four humours are predominant, so is the colour of lice, some being red, some white, some brown, some black; sometimes they burst out of all parts of the body, as in *Herod*, and in that *Portugal*, of whom *Forestus* speaks [l. 4. de vitiiis capitis] out of whose body they swarmed so fast, that his two men did nothing else but sweep them off, so that they carried out whole baskets full. Sometimes they breed but in some parts onely, as in the head or arm-pits. *Zacuta* mentioneth one who was troubled nowhere but in his eye-lids, out of which they swarmed in great numbers. Some have voided them by boils and imposthumes. *Forestus* speaks of one who had them only in his back, whom he advised to hold his naked back so close to the fire, till it blistered, out of which blisters they came, and so he was cured. Salt is an enemy to them, yet they are bred in those *Ethiopians* by the frequent eating of the salt locusts: But perhaps it is not the eating of the salt meat so much, as the nastinesse, and sweat, unwholesom waters, and corrupted air that breeds them. And it is certain, that wild and savage people are most given to them, because of their carelessse uncleanlinesse, using no other remedy against them, but shirts dyed with Saffron, which some wilde *Irish* doe wear six months together without shifting. But sometimes this disease is inflicted by the immediate hand of God, as a punishment of sinne and



and tyranny. Examples we have in *Sylla*, *Pherecides*, *Herod*, *Philip* the second of *Spain*, and others who died of this malady. Now because Locusts are such an unwholesome food, I cannot think that *John Baptist* did feed on them; and therefore it is no vulgar error, to hold, that *Aspidēs* in *Matth. 3.* doth signifie the tops of hearbs rather then locusts, both because these were an unwholesome food, and unpleasant to the palat and nose, used rather for Physick then diet, as *Dioscorides* and *Galen* shew, that Locusts are good against the Cholick and Stone, and may be more safely given then *Cantharides* to provoke urine. And although the *Æthiopians* did eat them for food, yet this is no argument to prove, that *John* did eat them; which is all the reason that *Beza* and *Casaubon* bring to prove their assertion: neither can it be proved, that Locusts were a food ever used in *Judea*: For *Pelusota*, who lived an Eremite many years in those Desarts, never knew any such food used there. But whereas they alledge, that in *Levit. [c. 11. v. 22.]* Locusts are set down for clean food: I answer with *Munster [on Levit. 11. 22.]* who though an excellent Hebrician, yet confesseth, that neither he, nor the *Rabbins* themselves, doe know the true meaning or signification of the proper tearms there used. Therefore the Hebrew word *Harbe*, which we translate *Locust*, the Septuagint call *Bruchus*, which is another kind of Insect. And the *French* in their Bibles have left the Hebrew word untranslated. And so did *Luther* before, as not knowing what that word meant, nor the other three Hebrew words. *Dr. Brown* then had done well rather to have reckoned the Baptists eating of Locusts among the Vulgar Errors, then his feeding upon hearbs in the Desart.

III. There is no flesh so much subject to putrefaction, as mans body, because it abounds in heat and moisture, so that oftentimes some parts of it doe putrifie before the soul leave it, which cannot so long preserve it from corruption, as salt, spices, the juice of Cedar, and other means by which the *Ægyptians* used to embalm their dead bodies. For indeed heat and siccity are enemies to putrefaction; therefore where the ambient air (which is properly moist) is excluded, there the bodies remain unputrified. Hence the bodies which are digged out of the hot and dry sands in *Egypt*, have there continued many hundreds of years uncorrupted. *Alexanders* body lay many days unburied and unbalmed, yet stunk not, but smelled odoriferously, because he had dried up the superfluous moisture of his body, by continual drinking of strong and fragrant wines. There  
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be also some wines that preserve dead bodies uncorruptible, by reason of their cold and exsiccating quality. So we read in the *Indian* stories, that upon the Mountains of *Chily*, bodies have been found dead there, which have many years without corruption continued. The first detectors of those Countries found it so by experience; for many of them were killed by the piercing subtil quality of those winds, and preserved from putrefaction by the excessive driness thereof. I have read of Horsemen sitting on Horse-back, with their bridles in their hands, yet dead many months before without any corruption. It is also the opinion of som, that bodies thunder-struck do not putrifie. I am apt to believe, that either they putrifie not at all, or not in a long time, because of the exsiccating quality of the sulphurous vapour which comes from the thunder and lightning. But there is nothing more apt to preserve dead bodies from corruption, then the juice of Cedar, therefore much used among the Ancients, both in preserving of their books and bodies; which by reason of their extream bitternesse and drying quality, gives life to the dead, and death to the living, extinguishing the temporary life of the body, and in recompence giving it immortality. So then we see that siccidity is the main enemy to putrefaction, which is the cause the Peacocks flesh is not so apt to putrifie as of other creatures, because of its driness, as Saint *Augustine* in the *City of God* sheweth, who speaks of a Peacock which in a whole year did not putrifie. The diet also is a great help to further or retard putrefaction; for they that feed plentifully on flesh, fish, or other humid meats, which breed much blood and humours, are apter to putrifie then those who feed sparingly on hard and dry meats. In the siege of *Amida*, by *Sapor* the Persian King, this difference was found; for the *European* bodies, who lay four days unburied, did in that time so putrifie, that they could scarce be known: but the Persian bodies were grown hard and dry, because of their hard and dry food, having contented themselves with bread made of *Nasturtium*, which we call Cresses, or nose-smart, an hot and dry hearb. Concerning the stone *Sarcophagus* which consumes flesh in forty days, as *Pliny* witnesseth, *L. 36. c. 17.* is no fable; for *Scaliger* writes, (*Exerc. 132.*) that in *Rome*, and in the Town where he then was, the dead bodies were consumed in eight days. But the stone *Chernites* is a preserver of flesh from corruption; therefore the Tomb of *Darius* was made of it. The like is writen of the hearb *Clematis*, or *Vinca pervinea*, which resisteth putrifaction; therefore



fore of old they used to binde the heads of young men and maids deceased with garlands of this hearb. And *Korrimanus* (*de mirac. mortuorum*) speaks of a dead head so crowned with this hearb, which in the year 1635. being taken out of the grave, was found uncorrupted. And as dead bodies embalmed with spices, are preserved from corruption; so by the same dead bodies, men are oftentimes preserved alive: for that stuffe which proceeds from them, called by the *Arabians* *Mumia*, is an excellent remedy against diseases arising from cold and moisture. *Francis* the first carried always some of it about him. It was found in the Tombs of those Princes who had been imbalmed with rich spices; but that which is found in ordinary graves, is not the true *Mumia*, but false, uselesse, or rather pernicious for the body, as not being of the same materials that the true *Mumia* was.

IV. That the presence of a dear friend standing by a dying man, will prolong his life a while, is a thing very remarkable and true, and which I found by experience: for about tenne years ago, when my aged Father was giving up the ghost, I came towards his beds side, he suddenly cast his eyes upon me, and there fixed them; so that all the while I stood in his sight, he could not die till I went aside, and then he departed. Doubtless, the sympathy of affections, and the imagination working upon the vital spirits, kept them moving longer then otherwise they would have done; so that the heart the seat of affection, and the brain the house of imagination, were loth to give off, and the spirits in them, to rest from their motion, so long as they had an object wherein they delighted. The like I have read of others: And truly the sympathy of affections, and strength of imagination is admirable, when the mind is able to presage the death or danger of a friend though a great way off. This also I found in my self: For once I suddenly fell into a passion of weeping, upon the apprehension I took that my dear friend was dead whom I exceedingly loved for his vertues, and it fell out accordingly as I presaged; for he died about the same hour that I fell into that weeping fit, and we were at that time 60 miles asunder, nor could I tell certainly, that he was dead till two days after. Thus to some the death of friends is presaged by bleeding at the nose, and sudden sadness, by dreams, and divers other ways, which the learned Poet was not ignorant of when he saith,

*Agnoit longe gemitum presaga mali mens. Æn. l. 10.*

So by

the Greek Poet the soul is called *prophetis*, a soothsayer of evil:



evil: The cause of this the *Gentiles* ascribed to the Sun, which they held to be the Soul, and our souls sparks of that great Lamp. A *Platonical* conceit which thought mens souls to be material; we were better ascribe this to the information of that Angel which attends us.

V. That which *Herodotus* (in *Thalia* c. 3.) writes of this difference between the Persian and the *Ægyptian* skulls, may be no fable; for in the wars between them such as were killed on either side, were buried apart: after their bodies were putrified, it was found that the Persian skulls were soft, but the *Ægyptians* so hard, that you could scarce break them with a stone. The reason of this might be, because the *Ægyptians* used from their childhood to cut their hair, and to go bareheaded; so that by the Sun their skulls were hardned. Hence it was, that few among them were found bald; but the Persians who wore long hair, and had their heads always covered, must needs have had soft skulls, by reason the humidity was kept in, and not suffered to evaporate, nor the Sun permitted to harden them.

#### CHAP. II.

1. The benefits of sleep, and reasons why some sleep not.
2. Why dead bodies after the ninth day swim. Why dead and sleeping men heavier then others; why a blown bladder lighter then an empty.
3. Strange Epidemical diseases and deaths. The force of smells. The Roses smell.
4. Strange shapes, and multitudes of worms in our bodies.
5. The French disease, and its malignity. The diseases of Brasil.

WHEREAS Sleep is one of Natures chiefest blessings for refreshing of our wearied spirits, repairing of our decayed strength; moistning of our feebled limbs, as the Poet speaks, *fessos sopor irrigat artus*, (*Virg. Æn* 3. & 4.) for easing of our diurnal cares, *Positi somno sub nocte silenti, lenibant curas & corda oblita laborum*. And therefore is, as *Euripides* calls it, *καταμαχον πόνον*, the remedy of our evils. And whereas in sleep the heart is at rest, as *Aristotle* rightly said, (though *Galen* who understood him not, checks him for it) from feeling, understanding, and inventing, though not from life and motion; I say, whereas by sleep we have so many benefits, it is a wonder that any should be found to live a long time without sleep. Yet I read in *Fernelius* (*Pathalog.* l. 5. ca. 2.) of one who lived fourteen moneths without any rest. And it

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is more strange what *Heurinus* (*Praxis*, l.2.c.7. records of *Nizolius*, that painful Treasurer of *Cicero's* words and phrases, who lived ten years without sleep. *Mecenas* was sleepleffe three years, saith *Pliny*. *Laurentius* in his Tract of Melancholy, knew some who could not sleep in three moneths; the reason of this might be, 1. The heat and driness of the brain, as is usual in decrepit and melancholy men. 2. The spareness of diet, so that no vapours could be sent up to moisten the brain or nerves. 3. The want of exercise and motion; for sedentary men are least given to sleep. 4. Continual cogitation and intention of the phantasie. 5. And adust melancholy humours. 6. Accompanied with continual fears, horrid and distemperate phantasies, representing to the mind unpleasant objects.

II. Why dead bodies after the ninth day swim upon the water, may seem strange, seeing till then they lie hid under the water. *Cardan* (*de subtil.* l.8.) gives this reason, Because between the *Peritoneum* and *Omentum* flatulent matter is ingendred, as appears by the great swelling of the belly. Now this flatulent matter is begot of humidity dissolved by heat, which heat is procreated of putrification. Besides, we see that putrified bodies, as eggs, fruit, wood, grow light, because their solid parts being consumed, what remains are porous and full of air: for experience teacheth us, that the more porous and aerial the body is, the lighter it is, and lesse apt to sink; and perhaps may bee the reason why that body which wants the Spleen, swimmeth, not being a porous light substance: And those men who have capacious lungs to hold much air, can dive and live longer in the water then others. And surely some people whose bodies are active, subtile, and quick, will not sink so soon as men of duller spirits. Such were the *Thebii*, a people which could not sink; so that it is a vain way to conclude those to be Witches, who do not presently sink. Hence also it is plain, that dead bodies are heavier then living, though *Dr. Brown* (*of Errors*, l.4.c.7.) contradict this, because he found no difference between a Mouse and a Chick being dead and alive, in respect of gravity. A weak reason to reckon a received truth among his vulgar errors; for though there were no sensible difference in such little animals, which have but few spirits, yet in men which are of a greater bulk, & in whom do abound vital and animal spirits, to say there is no difference of gravity in their life and death, is to contradict sense and reason; for every woman that attends upon sick men, knows that they are more pondrous when dead, then when alive, being used



to lift and turn them. Reason also grounded on experience, teacheth us, that those bodies are lightest in which air is predominant; therefore doubtlesse where there is store of such pure and refined air as the spirits are, there must be lesse gravity, then where they are vvanting: his Error is grounded on a false supposition, in thinking there is gravity in the spirits themselves, because they participate of corporeity, as if gravity vvere an essential property of bodies, vvhereas there is no gravity in the pure fire, nor in the Stars and Heavens, and yet these are bodies. Besides, if the spirits had any gravity in them, it must follow, that living bodies are heavier then dead carcasses, which is absurd to think. Again, I would know, vvhy inebriated Apoplectical and swooning persons are heavier then others; is it not because their spirits fail, and they resemble dead men? And so in sleep the brother of death the body is heavier; every Nurse that carrieth her child in her arms will tell him this. Why doth a man fall down in his sleep, who stood upright when he was awaked, If he be not heavier then he was? The Scripture acknowledgeth, that even the Apostles eyes vvere heavy vvhen they vvere sleepy. And vvhereas he proveth the spirits to add vveight to the body, becaus *a man that holds his breath is weightier while his lungs are full, then upon expiration: And a bladder blown is heavier then one empty.* I answer, that I could never find this experiment true, though I have made trial. 2. It seems to be false, because the blown bladder vvill swim vvhen the empty one sinks. 3. If I should yeild him this, yet his sequel is nought, except he can prove the animal spirits in a mans body, to be as thick and course as the grosse vapour which is blown into the bladder, which is neither air in name nor purity, much less to bee compared to those subtil spirits, vvwhich are so pure and apt to vanish, that nature vvvas forced to inclose them vvithin the thick walls of the nerves. So likewise the air retained in the lungs, may perhaps add vveight to the body, because the longer it stais there, the more it degenerates into a thick vapour, by reason of the bodies moisture, and so may become ponderous.

III. God is pleased many times to punish whole Nations by extraordinary epidemical diseases, for the sins of the people. So vvvas England visited vvith a sweating sicknesse; so vvvas Poland vvith that disease called Plica, of vvwhich vve have spoken; so vvvas *Ethiopia* (as is already said) visited vvith the Loufie disease. *Forestus* (*Observ. medic. part. 3.*) records, that in *Syracusa*



*causa*, there was an universal disease, called the hungry sickness, in which people did continually desire to eat, and were never satisfied. Of this multitudes died; at last it was observed, that this disease proceeded of Worms, which were expelled by *Bolarmenick* and *Treacle*. And *Hollerius* reports, that at *Beneventum* many died of intolerable pains in the head, caused by Worms ingendred there, vvhho also mentions one *Italian*, who by smelling much to the hearb *Basil*, had a Scorpion which bred in his brain, and killed him; this is not impossible if wee consider, that according to the disposition of the petrified matter, and the preparations made for introduction of the form, divers shapes of creatures are begot; and it seems there is a great sympathy between the *Basil* and the Scorpion, vvhich did facilitate the generation: neither are we ignorant vvhats force there is in smells, both to breed and expel diseases; and even to prolong and shorten life; as appears in divers Histories, of some that have died vvith the smell of coals, others of new vvort or ale, as those two Monks recorded by *Forestus* (*Obsery. medic. part. 1.*) although I suppose it was not so much the smell as the smoak of the coals and vapours of the air that suffocated the spirits; yet such is the force of smells, that some have been purged by passing by or entring into Apothecaries shops, vvhilest they were preparing purgative medicaments; And divers vvith the smell of the purges vvich they carried in their hands, have been as much purged, as if they had taken the whole substance. But this I ascribe not so much to the smell (vvhich is a meer accident, and cannot passe from one substance to another, but is in some subjects wherein it is inherent) as to the subtile vapours vvich from the physick being smelled, convey the smell to the body. The same reason may be given why some are offended vvith smells vvich to others are pleasant; so I have read of *Francis* the firsts Secretary, who was forced to stop his nostrils vvith bread vvhen there were any apples at table: and so offensive was the smell thereof to him, that if one had held an apple neer his nose, he would fall a bleeding. *Marcel. Danat. adm. hist. l. 6. c. 4.*

And Cardinal *Carafa* did so abhor the smell of roses, vvich of all smells is most delightful to man, that during the rose time he durst not go out of his doors, for fear of encountering vvith that smell; nor did he suffer any to come vvithin his palace that had a rose about him. This I ascribe to the phantasie and naturall antipathy between him and the rose: Such power there is in smells, that the Ancients ascribed a Divinity to



them; and because good smells do so chear the spirits, hence they were used in Temples both amongst Jews, Gentiles, and Christians. *Homer* describes his *Juno* by the sweetnesse of her smell, and so doth *Virgil* his *Venus*: *Ambrosiaque coma divinum vertice odorem spiravere*; the like doth *Plutarch* his *Isis*, and so doth *Ovid*: *Manfit odor, possis scire fuisse Deam*. But for the Rose there may be some manifest causes why its smell may bee offensive: for some brains are extraordinary cold, some extraordinary dry, and whose olfactive passages are wider then usually; to such the smell of Roses may be hurtful, because the Rose hath but a weak heat, or rather is refrigerative, as *Dioscorides* thinks which may comfort the hot, but not the cold brain. And if the brain be dry, & the passages wide, the smell doth too suddenly affect it, which may procure an aking. but why *Hysterical* women, and such as are troubled with the Mother, are apt to swoon at the smell of Roses and Lillies, and other sweet odours, is, because the Matrix delighteth in these smells, and therefore riseth toward them, to the danger of suffocation; whereas it is suppressed by strong and unpleasant odours. There are indeed in the rose different parts, which have different qualities, but the predominant are moistning and coldness; whence to cold and moist brains, the smell is not proper, but to hot brains the rose is comfortable: therefore the Ancients in their drinking matches, used to wear rose garlands, and to lie upon beds of rose-leaves for refrigeration. *Mitte jectari rosa quo locorum sera moretur. Horat. l. 1.*

*IV.* It is almost incredible, what is written of the multitudes, divers shapes, and length of worms bred in our bodies, if we had not the testimony of so many grave Physicians to prove this. *Forestus* out of *Hosium* (*Obs. Med. part. 1. Obs. 2.*) shews, that at *Beneventum* in Italy, there was a great mortality, which much troubled the Physicians, not knowing the cause thereof, till they opened one of the dead bodies, in whose brain they found a red worm yet alive: This they tried to kill by divers medicaments, such as are prescribed against worms, but none of them could kill it. At last they boiled some slices of Radish in *Malaga* wine, and with this it was killed. He shews also, that one being cured of the *French* malady, was notwithstanding still tormented with the head-ach, till his skull by advice was opened; under which, upon the *Dura mater*, was found a black worm, which being taken out and killed, he was cured. *Brasavola* records, (*in 16. Aphorif. l. 3. Hippocr.*) that an old man of 82 years, by a potion made of *Scordium* and sea-moss, voided five



five hundred worms, which was the more strange in so old a man, whose body must needs have been cold and dry; yet it seems he wanted not putrified matter enough to breed them. *Alexander Benedict* speaks of a young maid, who lay speechless eight days with her eyes open, and upon the voiding of forty two worms, recovered her health, (*lib. de verit. & rerum.*) *Cardan* records, that *Erasmus* saw an *Italian*, who spoke perfect *Dutch*, which he never learned, so that he was thought to be possessed; but being rid of his worms, recovered, not knowing that he ever spake *Dutch*. It is not impossible in extasies, phrensies, and trances, for men to speak unknown tongues, without witchcraft or inspiration; if we consider the excellency and subtilty of the soul, being sequestred from corporeal Remora's, and so much the rather, if with *Plato*, we hold that all our knowledge is but reminiscency. *Ambrose Parry* (*lib. 19. c. 3.*) sheweth, that a woman voided out of an imposthume in her belly; a multitude of worms about the bigness of ones finger, with sharp heads, which had pierced her intestins. *Forestus* (*l. 7. Obs. 35.*) tells us of a woman in *Delph*, who in 3 several days voided 3 great worms out of her navel; and not long after was delivered of a Boy; and then seven days after that, another. *Thad. Dunus*, speaks of a *Switzer* woman, who voided a piece of a worm five ells long, without head and tail, having scales like a Snake. After this she voided another bred in her bowells, which was above twenty ells long. This poor woman was tortured so long as she was fasting; but when she ate, she had some ease. I could set down here many other stories of Worms, voided out of mens bodies, some having the shape of Lizards, some of Frogs, some hairy and full of feet on both sides, some voided by the eyes, some by the ears, some by vomiting, some by the stool, some by urine, some by imposthumes, but I will not be tedious; these may suffice to let us know of what materials this body of ours, which we so much pamper, is composed, and how little cause we have to be solicitous for the back and belly; and vvithal let us stand in awe of God, vvho vvhen he pleaseth can for our sins, plague us vvith vermin in our bodies vvholes we are yet alive.

V. I said before, that divers Countries had their peculiar diseases; the *French* sickness as we now call it, vvas peculiar to the *Americans*, and not known to this part of the vworld; but *Christopher Calumbus*, brought it from *America* to *Naples*. Now it is become common, and yet no disease more pernicious, and vvwhich breeds more dangerous symptoms and tortures



in the body. This is that great scourge with which God whips the wantonnesse of this lascivious age: not without cause is this called the *Herculean* disease, so hard to be overcome, and the many-headed *Hydra*: the poison of it is so subtile, that not only it doth waste the noble parts, and spoils the skin even to the losse of all the hairs both of head, beard, and eye-brows, besides the many swellings and bunches it causeth, it pierceth also into the very bones, and rots them, as *Fernelius* fully describes. ( *De abdit. rer. causis*, l. 2. ) I have read of some who have been suddenly struck blind with the infection thereof. *Zacuta* mentions one who was so blinded that he could never recover his sight again. And another who was troubled with an *Ophthalmy*, the poison of which was so violent and subtile, that it infected the Chyrurgion that cured him; ( *Prax. mira*, l. 2. ) by which it appears this disease is infectious at a distance. There is another peculiar disease in *Brasile*, called the Worm, which comes with an itch and inflammation of the fundament: if this be taken in time before the Fever comes, it is easily cured by washing the place affected, with the juice of Lemmons, whereof that Countrey abounds; but if it be neglected till it come to a Carbuncle, it is harder to be cured, and not without the juice of Lemmons and Tobacco. But if this by carelesnesse be omitted, no help will then prevail; and so the party dieth with a thirst or fever, which is strange. Not unlike to this is that disease which *Zacuta* speaks of, of one who was tortured with a terrible pain in his Hip and Fundament, with a violent Fever: upon this he openeth the outward ancle vein, out of which gushed scalding blood, and with it a living Worm, the breadth of ones palm, and so the party was cured. It seems the poison of this Worm had reached into the Hemorrid veins in the fundament, which caused that pain. *Linschoten* (in his voyages) makes mention of another disease familiar to the *Brasilians*, called *Pians*, proceeding from their lechery; it maketh blisters bigger then the joynt of a mans thumb, which run over the whole body and face.

CHAP.



CHAP. III.

1. Centaurs, proved what they were. 2. Why the sight of a Wolfe causeth obmutescency. 3. Pigmies proved. Gammadim, what. 4. Giants proved: they are not monsters. 5. The strange force of Fascination. The sympathies and antipathies of things. The Load-stones attraction, how hindred. Fascination, how cured. Fascination by words.

**T**HAT there have been Centaurs, that is, Monsters, half Horses, and half Men in the world, I make no question, though Dr. Brown, (Book 1. c. 4.) reckons this among his *Vulgar Errors*, who should have made a distinction between Poetical fictions, and real truths: For Centaurs are Monsters, and aberrations from nature; not the common nature of all things, which intends and effects Monsters, to shew Gods wrath against sin: but from the particular nature of those creatures of which they are ingendred. Therefore S. Jerome in the life of Paul the Eremite, speaks of a Centaur seen by Paul. Pliny Nat. Hist. 1. 7. c. 3. was an eye-witnesse to this truth: For he saw in Thessaly a Centaur, which was brought out of Egypt to Claudius Caesar. Ambrose Parry (l. 15. de Monstris) speaks of a Centaur which in the year 1254, was brought forth at Verona: there is no doubt then but Centaurs as well as other Monsters, are produced, partly by the influence of the stars, and partly by other causes, as the ill disposition of the matrix, the bad temperature of the seed, the perverse inclination of the woman, the commixtion of seeds of divers kinds, sudden fear, bad diet, unwholesome air, and untimely Venus. But we must not think that these Centaurs were men, or parts of men; for they had not a reasonable soul, and therefore not capable of the resurrection. Neither must we think that these had two natures and essential forms in one body, to wit, of a Man and a Horse: for as every entiry hath but one specifical essence, so it hath but one form which giveth that essence; so that one and the same thing cannot be under divers species in the predicament of substance. And as there cannot be two distinct forms, so neither can there be a mixtion of them in the Centaur: For the form or essence admits neither intention nor admission: *Ex duobus entibus per se, non fit unum ens per se*; yet I deny that there were ever a generation of people called Centaurs, as they are described by the Poets; for by this fiction they under-



understood voluptuous and lascivious men, who by *Hercules*, that is, men of courage, wisdom, and strength, were subdued and brought to civility, as we have shewed elsewhere (*in Myst. Poetico*) which fiction was occasioned by the first sight of men on Horseback in *Thessaly*.

I I. That some men have become speechlesse at the sight of a Wolf, is no fable, if either we consider the antipathy that is between a Man and a Wolf, or the malignity of that vapour which proceeds from the Wolf, or the violence of a sudden fear which presently bringeth obmutescency, as the Prince of Poets sheweth, (*Æn. 2.*) *Obstupui steteruntq; comæ & vox faucibus hæsit.* *Camerarius* the Father (*Prob. 1. Dec. 7. medit. Histor. part. 2. Cent. 40.*) sheweth in his Problems, (which is confirmed by *Philip* his son) that one who had caught a Wolf in a Gin, by coming too neer him, was so poisoned by his breath, that his hands and face which were naked, did swell to a monstrous bigness: so that in a long time he could scarce be cured. And what wonder is it, that the sight of a Wolf should make a man speechlesse, when the shadow of the Hyena, will make a Dog dumb; when a Horse, if he smell but the foot-step or the gurs of a Wolf, will kick and fling as if he were mad, and a Mare will cast her Colt, as they witness who write the Natures and Histories of beasts; therefore the Proverb, *Lupus in fabula*, was not grounded upon a fable. Dr. Brown then did unadvisedly reckon this among his vulgar errors, (*3 Book c. 8.*) for I believe he would find this no error, if he were suddenly surprised by a Wolf, having no means to escape or save himself; and yet I do not hold that every one vvho is seen by a Wolf, is dumb, becaus some are of undaunted spirits, and some have the advantage of the Wolf, and some are not apt to be infected by his breath; yet it will not follow, that it is a vulgar error; if I hold a man grows silent at the sight of a Wolf, or that he hath an infectious breath: For it is no vulgar error, to hold the plague an infectious disease, and yet all are not infected by it.

I I I. That there have been Pigmies in the world, that is, people of a cubit or two high, so called from *πῶγων* a cubit, and *Troglodits* from *τῶγα* an hole, for they dwelt in holes, as *Aristotle* sheweth; and *Spithamei* from their small stature, scarce exceeding 2 foot and a quarter: I say, that there have been such, I make no question, when I consider the multitude of eminent Authours who have vvrit of them, and that no reason was ever yet alledged, to deny them. Nay, it stands vvith reason there should be such, that Gods wisdom might be seen in all

forts



sorts of magnitudes: For if there have been Giants, why not also Pigmies, Nature being as propense to the least as to the greatest magnitude: Besides, the reasonable soul is not extended in the body of a Giant, nor contracted in the body of a Pigmie; but can inform the one and the other without augmentation and diminution. *Nicephorus* (*lib. hist. Eccles. c. 37.*) affirms, that in the time of *Theodosius*, was seen in *Egypt* a Pigmie so small of body, that he resembled a Partridge, he exercised all the functions of a man, and could sing tunably. *Pliny* (*lib. 7. c. 16.*) speaks of *Conopas*, whom *Julia* the Niece of *Augustus* kept still by her; he was not much above two foot long. He also affirms, that under *Augustus* there lived *Pusio* and *Secundilla*, whose bodies were preserved as miraculous in a monument within the *Salustian Garden*; they were not much above half a foot. *Cardan* relates (*de subtil.*) that there was in *Italy* a Pigmie of a cubit long, kept in a Parrets Cage. Many more of these Pigmies I could alledg, but these shall suffice to shew there have been such. And that there have been a Nation of Pigmies, *Aristotle*, *Pliny*, *Pomponius*, *Mela*, *Aulus Gellius*, *Solinus*, *Albertus magnus*, and many others will witness. It is true that *Strabo*, *Scaliger*, and some others have denied them; and therefore *Dr. Brown* reckons the opinion concerning Pigmies, among his *Vulgar Errors*: But if the incredulity of two or three Writers be enough to make a *Vulgar Error*, what a multitude of Errors will there be? For what truth is there in the world which by some or other hath not been doubted or denied? But they say, that the Assertors of this opinion, do not agree about the place of the Pigmies abode; some placing them in *India*, some in *Ethiopia*, some in *Scythia*, some in *Greenland*. I answer, Circumstantial differences cannot overthrow the substance of a truth. Much difference there is about *Ophir*, where it stood, some placing it in *Sumatra*, or *Aurea Chersinesus*, some in *Africa*, some in *Peru*. So men cannot agree about *Tharsis*, some making it a Town in *Cilicia*, others *Carthage* in *Africa*, some *Tartarus* in *Spain*; shall we hence infer that there were never any such places? I am of opinion, that because they differ in the place of the Pigmies, and not in the thing it self, that there were Pigmies in all the forementioned places. *Buchanan* speaking of the Isles of *Scotland*, amongst the rest, sets down the Isle of Pigmies, in which there is a Church where are yet digged up divers small skulls and bones, answering to the report of the Pigmies little bodies; so that the inhabitants and neighbours make no question, but that



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that Pigmies of old dwelt there. *Rer. Scot. l. i.* Now Aristotle is so confident of his Pigmies, that he plainly tells us it is no fiction, but a manifest truth, *Hist. animal. l. 8. c. 12.* ἐκ δὲ τῆς τοῦ θύου ἀλλ' ὅτι καὶ τὴν ἀλήθειαν. And it is like that these Pigmies were all one with the *Nabæ* or *Nubæ*; a people that dwelt about the Springs of *Nilus*, and so they are called *Νῶ-βαυ Πυγμαῖοι*, both these people are said to dwell about the Springs of *Nilus*, both were *Troglodites*, or dwelt in holes. And *Nonnesus* in *Photius* is said to have lighted upon these Pigmies in his Navigation about those places where the *Nubæ* dwelt. Neither is it a sufficient reason to denie Pigmies, because some ridiculous things are written of them, as that they fight with Cranes upon the backs of Rams, or Goats, though this be ridiculous, yet it may be true; for there are some ridiculous truths, and some serious lies. But if this were a fable, yet that there were Pigmies, may be a truth: there be many fictions made of *Saturn*, *Jupiter*, *Janus*, and other Heathens, Likewise of *S. Christopher*, *S. George*, *S. Francis*, and many other Christians; shall we therefore conclude there were never any such men? Neither was *Homer* the first that makes mention of Pigmies: for *Ezechiel* long before spake of them (*Ezek. 27. 11.*) for the word *Gammadim* is translated Pigmies by *Aquila*, *Vatablus*, *Lyra*, *Arias Montanus*, the vulgar Latin, and *Munster*, who affirms that all the *Hebrews* expound the word thus. Besides, the *Italian* and *Spanish* Translations use the word *Pigmie*, and do not retain the textuary word, as the Doctor thinks, though the *French* and *English* Translations do. Now why the *Septuagints* translated the word *Gammadim* into Watchmen, I know not, except they meant those three thousand Pigmies which a certain King of *India* did entertain for his Guard; for though they were small of stature, yet they were good Archers.

IV. That there have been Giants, that is, men of extraordinary strength and stature, is not to be questioned, since they are mentioned in so many Stories often in the Scripture: For what were *Og*, *Sampson*, *Goliath*, and the *Anakims*, but Giants? It is written that *Pallas*, the Son of *Evander*, whom *Turnus* killed, was higher by the head then the Walls of *Rome*: For eight hundred years after Christ, his body was found near the Walls, which being set upon its feet, the shoulders thereof touched the Pinacles of the Wall. *S. Augustine* (*de Civit. Dei, l. 15. c. 9.*) saw a mans tooth bigger then his fist. *Jos. Acosta* (*Hist. Ind. l. 7.*) shewes there were Giants in new Spain:

For



For he saw, at *Mexico*, a tooth as big as a mans fist. About the Straights of *Magellan* there are Giants ten or eleven foot high. (*Acost. l. 1. c. 9.*) The bones of Giants found in *Peru*, are thrice as big as the *Indians*. *Cambden* tells us of two teeth found in *Essex*, which would make two hundred of ours. And if you will believe *Nunesius* the Jesuit, (*de rebus Japan*) the King of *China* was guarded with Giants, which are also the Porters of his chief City. I will say nothing of the Giants mentioned by *Pliny*, *Plutarch*, *Herodotus*, and others. Before the Flood there were greater store of them then since, because the vigour of the Sun, the fertility of the earth, the goodnesse of food, and the seed of generation did decay. But we must not think that Giants and Pigmies are Monsters, seeing they are not the errors of nature, which aimeth at their generation, according to the proportion of seed, which admits of extension and remission: But if the quantity be such, that the functions of man are hindred, such may be called Monsters, as that young Giant at *Millan*, which *Scaliger* saw, (*Exerc. 263.*) which was so tall, that he could not stand, but lie along, extending his body the length of two beds joyned together. What the *Greeks* have feigned of the Giants, I have spoken elsewhere, *Mythag. Poet.*

V. That divers diseases are procured by fascination, that is, by a malignant look, or aspect, is manifest by innumerable testimonies of good Authours. Now fascination is twofold, Diabolical and Physical, or Natural: Of the former I doe not speak, but of the latter, which causeth diseases, not by the look, or sight it self, which consisteth rather in reception with *Aristotle*, then in emission with *Plato*, (although I deny not some kind of emission there is) but I say, fascination causeth diseases three ways: First, when the horrid and truculent look of a malicious deformed Hag affrights children and tender natures; upon which proceeds an agitation and sudden commotion of the spirits and humours, whence ensueth diseases. Secondly, by some malignant vapour, breath, or spirit from the eye or mouth. Thirdly, by a secret antipathy: so there are who will swoon and sweat at the sight of certain meats which they abhor: And indeed sympathies and antipathies there are almost in every Simple which we receive for physick, as *Fernelius* (*de abdit. rer. caus. l. 2.* shews:) hence it is, that some things purge onely the Spleen, some the Liver, some the Breast only. Hence also the *Cantharides* are offensive to the Bladder, *Lepus marinus* to the Lungs: But that History is strange which is recorded



corded by *Francis Mendosa* (*lib. 4. de Flor. Philos. Problem. 11.*) of the Duke of *Brigantia's* one-eyed servant, who with his eye could make any Falcon or Sparrow-Hawk in their flight fall down to the ground as if they were dead : this could not bee by any malignant vapour that did reach so high : it must bee therefore a strange antipathy, of which we can give no more reason, then why the Load-stone draws Iron, or draws it not when touched with Garlick. Why the stone *Selenites*, as *Fernelius* shewes, touching the skin, should stay bleeding in any part of the body : or why the Ring in which it is set, being put on the third finger, stays the Dysentery within an howre : Why Rhubarb and Scamony purgeth choler; Epithemium, Polypodium and Sena, melancholy ; Agarick phlegme : and why Quick-silver delights so much in gold : Why the shadow of the *Fraxinus* or wilde-Ash is so pernicious to Serpents. Why there is such antipathies and sympathies among Hearbs & Trees. I know what I said but now (*Book 2. c. 3.*) of the Garlick in hindring the Load-stones attraction, is contradicted by Doctor *Brown*, and before him by *Baptista Porta* ; yet I cannot believe that so many famous Writers who have affirmed this property of the garlick, could be deceived ; therefore I think that they had some other kinde of Load-stone, then that which we have now. For *Pliny* and others make divers sorts of them, the best whereof is the Ethiopian. Though then in some Load-stones the attraction is not hindred by garlick, it follows not that it is hindred in none ; and perhaps our garlick is not so vigorous, as that of the Ancients in hotter Countries ; yet I finde, that not onely by garlick is this attraction hindred, but also by fire, rust, oyl, and other fat things, also by the presence of another Load-stone ; and that as it draws the Steel with one end, so it repels it with the other. But to return to our Fascination, that it is caused by an occult quality, is plain, because it is cured by another occult quality : For *Mendosa* (*Prob. 11.*) sheweth, that it is known by experience how Fascination is cured by the foot of a Mole or Wont laid to the childes forehead, which can be nothing else but a natural antipathy : and that Fascination is caused by a contagious breath infecting the aire, is plain, by the story of the Basilisk killing with his look or breath rather, at a distance. There is also a Fascination by words, which the Poet mentions, *Ecl. 11.*

*Qui ne ultra placitum laudarit, Bacchare frontem  
Cingite, ne vati noceat mala lingua futuro.*



We know there is great efficacy in words to move the affections, upon which the spirits and humours of the body are disturbed, which causeth oftentimes diseases.

CHAP. IV.

1. Strange stones bred in mens bodies.
2. Children nourished by Wolves and other Beasts.
3. Poison taken without hurt. Poison eaters may infect, how. How Grapes and other Plants may be poisoned.
4. Of strange Mola's. Bears by licking, form their Cubs, the Plastick faculty still working.

**T**HERE is nothing more strange in mans body, then the generation of stones, whereof there be so many and diversly shaped: in the joints stones are bred by the gout, called therefore *Lapidosæ Chiragra*; stones are bred ordinarily in the kidneys and bladder, of slimy matter by the heat of these parts; some are ingendred in the Liver and Spleen; some also in the heart. *Hollerius* speaks (*Com. 1. in lib. 6. Sect. 2. Aphor. 4.*) of a woman which died of an imposthume in the heart, where-in were found two stones; in the heart of *Maximilian* the second Emperour, were found three stones, which afflicted him very much, with a trembling of the heart, as *Wyerus* witnesses, (*l. 4. c. 16.*) In the intestins also sometimes stones have beene found. *Zacutus* speaks (*lib. 3. de præx. ad obs. 124.*) of a young man disordered in his diet, who used to void by the seed divers stones, and at last died of a stone that was found in his Colon, in form like a Chesnut, and as big; this could not be voided whilst the party lived, neither by Glysters nor Purges, nor any other physick: some have thought that these stones in the intestins are hardned by cold, which cannot be; for though intense cold doth harden as well as heat, which we may see in frosts hardning water and dirt, & in the generation of chrystal: and though we should yeild to *Galen*, that the intestins being membranous and spermatical parts are colder then the sanguineal, yet we cannot yeild that in a living body, there is actual cold; for all parts are hot, yet some more, some lesse; therefore these stones are not ingendred by cold, but by a preternatural heat in the body. The same *Zacutus* (*Obs. 135. l. 3.*) speaks of a strange stone found in a mans bladder; it was round like a Ball, but had issuing from it divers pyramids, and between each of them a sharp prickle like a needle, (*l. 1. Obs. 96.*)



I have read of some who with coughing have voided stones out of their Lungs. One (*l. 1. Obs. 95.*) by coughing voided a stone out of his Lungs, hard and long like a Date stone, so heavy that it weighed almost twenty one grains: But no stone so much to be admired was ever known, as that which was found in the matrix of a dead mother, of which we spake before, to wit, a dead childe that had continued there twenty eight years, and was turned to a stone.

*II.* That some children have been nourished by wild beasts, many histories do assure us: *Plutarch*, *Cicero*, and others tell us of *Romulus* and *Remus*, who were nourished by a shee Wolf. *Justin* assures us, that *Cyrus* suckt the duggs of a Bitch. *Pausanias* in his *Corinthiacks*, writes, that *Æsculapius* was educated by a Hinde. *Ælian* in his various Histories, speaks of a Bear which gave suck to *Atalanta*, being exposed; of a Mare that nursed *Pelias*; of a she-goat whose duggs *Ægyptus* suckt; and of *Telephus* that suckt a Hinde. Divers others I could alledg, but these are sufficient to let us see the cruelty of some parents, and the kindnesse of some beasts far more merciful then man. Besides, the special care and providence of God towards tender and impotent infants: Yet I know *Livy* contradicts the story of the Wolf, that nursed *Romulus*, and so doth Dr. Brown, having no other inducement but that of *Livies* authority, whereas the other Historians and Monuments of *Rome* affirm it. Besides, it is no more incredible for a Wolf to nurse a child, then for a Raven every day to feed *Elijah*. But besides ancient stories, there be divers late Records of some children who have been nourished by Wolves within these few years in our neighbour Countries. In the Lantgrave of *Hesse* his Countrey, was found a Boy who had been lost by his parents when he was a childe, who was bred among Wolves, and ran up and down with them upon all four for his prey. This Boy was at last in Hunting taken and brought to the Landgrave, who much wondring at the sight, caused him to be bred among his servants, who in time left his Wolvish conditions, learned to walk upright like a man, and to speak, who confessed, that the Wolves bred him, and taught him to hunt for prey with them. This story is rehearsed by *Dresserus* in his Book of new and ancient Discipline, *Hist. Med. part. 1. c. 75.* The like story hath *Camerarius* of two children, which had been bred among Wolves, and taken in the year 1544. I have read of a man bred among Wolves, and presented to *Charls* the ninth of *France*. And a strange story is extant, written by *Lewis Guyon*

Sicut



*Sieur de la Nauche*, (l. 2. *Divers. Lection*. c. 34.) of a childe that was carried away in the Forest of *Ardenne* by Wolves, and nourished by them. This child having conversed with them divers years, was at last apprehended, but could neither speak nor walk upright, nor eat any thing except raw flesh, till by a new education among other children, his bestial nature was quite abolished. We see then it is not incredible for children to be nursed by Wolves; of which perhaps the old *Irish* were not ignorant, when they prayed for Wolves, used them kindly, as if they had been their own sons, as wee may read in *Cambden* (*Hist. Hiber.*) out of *Goade*.

III. That some can take poison without hurt, is plain by the story of *Mithridates*, who could not be poisoned.

*Profecit poto Mithridates sape veneno,  
Toxica ne possint seua nocere sibi.*

This story is confirmed by *Pliny*, *Gellius*, *Calius*, and others. There is a story of the King of *Cambaia*'s son, who by constant eating of poison, he had so invenomed his body, that the Flies which suckt his blood swelled and died. *Solinus* speaks of a people called *Ophyophagi*, because they fed on serpents. *Avicenna* speaks of one in his time, whose body was so venomous, that whatsoever touched it died. I have read also in *Aristotle*, of a Maid who was nourished with poison. The like story is mentioned by *Avicen*. *Alb. Magnus* speaks of a Maid who delighted to eat Spiders. *S. Augustine* (*de morib. Mon.* S. 2. c. 8.) speaks of a woman who drank poison without hurt. Many other examples there may be alledged; but these may suffice to let us see, that either by Art or by Nature mens constitutions may be fortified against the malignity of poison, as well as other animals which feed upon poison, as *Vipers* do upon *Scorpions*, *Stares* on *Hemlock*, *Ducks* on *Toads*, *Quails* on *Hellebor*, *Poultry* and *Monkies* on *Spiders*. Not to speak of miraculous power, by which many *Martyrs* have been preserved from poison, as was foretold in *S. Mark* ch. 16. *If they drink any deadly poison, it shall not hurt them*. Besides, mens complexions according to their ages doe vary, so that what hath been poisonable at one time, is not at another. Thus some that could not abide cheese in their youth, have eaten it in their age: We see also how custome becomes another nature: for hot *Climats* to *Northern* men at first, prove pernicious, but afterward by custome become familiar and natural: Therefore *Dr. Brown* (*Book 7. c. 17.*) hath no reason to reject that story of the *Indian King*, that sent unto *Alexander* a fair wo-



man fed with poison, purposely to destroy him by breath or copulation; because saith he, that poisons after carnal conversion, are so refracted, as not to make good their first and destructive malignity. I answer, They are not so refracted; but that they leave behind them in the flesh, a venomous impression and quality: For if the ordinary food we take, is not so mastered by the stomach, but that by way of reaction (for *omne agens naturale in agendo repatitur*) it alters the body; much more must poisons, which are more active. Hence hot bodies are cooled by Lettice, Sorrel, and other refrigerating meats; and cool bodies are heated by the frequent use of Spices and Wines, and other heating viands: we see that neither our stomach nor liver, can so master and refract garlick, onions, radishes, and divers other things we feed on, but that the urine will retain the smell thereof. The flesh of the Thrush, that feeds on Juniper berries, retains the relish thereof: The milk of the beast that feeds on Hellebor or Scammony, will purge the body. If an infectious breath or smell, can destroy another body; why may not the same bee effected by those who are accustomed to eat poison? *Galen* tells us, (*l. 11. Simpl.*) that by long use the flesh may be infected by aliments. And *Capivaccius* affirms, that they are in danger to be poisoned, who touch the dead bodies of those who have been poisoned. Therefore *Plato* reports, *l. de veneno in Phædra*) that their bodies who were condemned to die by poison, were washed before they drank the poison, not after, lest the Washers might be infected. *Cardan* (*de Subtil. l. 9.*) tells us, that though all vipers be poisonable, yet those are more venomous which feed on Toads: And which is more strange, *Simon Gennensis* assures us, that Grapes will become poisonable, if whilst the Vine is inoculating and grafting, poison be put in it; and the Wine will prove laxative, if Scammony be inserted in the Vine; which also *Reynaldus de villa nova*, proves may be effected in other plants. Lastly, that which is poison in one Countrey, is not poison being transported into another Climat, as it is known of the Peach, which in *Persia* is venomous, but being transplanted, loseth the deleterious quality.

IV. *Levinus Lemnius* tells us, that the Belgick women are much subject to false conceptions, (*l. 1. de occultis mir. c. 8.*) chiefly that which is called *Mola*; being as *Laurentius* writes, (*Anato. l. 8.*) a [fleshy infirm lump without motion, begot in the matrix of the woman, of imperfect seed.] These are most subject



to those conceptions, who are most addicted to disordered copulation, not regarding the manner, time, or measure thereof. Nature indeed aiming at the eternity and propagation of the species, begins to elaborate a childe; but being hindred by the abundance, weaknesse, and other vitiosities of the seed, and menstruous blood, besides the ill disposition of the matrix, is forced to leave the work imperfect. Hence this lump remains inarticulate, and sometimes is cast out the ninth moneth, sometimes sooner, and in some it remains three or four years: in some it is bred without the help of man, only by the strength of imagination, and mixture of the female seed with the blood. But this is denied by *Laurentius*, who also affirms the *Mola* to be without motion, which *Zacuta* contradicts (*Prax. Mir.* 2. *Obs.* 144. & 140. & 147.) For hee speaks of one which being put into a vessel of water, moved it self like an Hedgehog, and lived two days. It was bigger then a mans head, and so hard, that scarce could a knife cut it. In the midst of it were three eyes, beset round with long black hairs. He speaks of another which being cut, was like an Onion, full of tunicles or membrans within one another. He writes also of a woman who in the space of fifteen days was delivered of 152 small *Mola's*, or fleshy lumps. Now it is observable, that no creature is subject to this false conception but women, partly because of sin, partly by reason of their humid constitutions, idlenesse, and moist food: Yet we read that Bears cast forth their cubs unshapen and unformed, which afterward they form by licking them. *Dr. Brown* (3. *Book* c. 6) placeth this among his *Vulgar Errors*: I confesse in his Book he shews much reading and learning, yet he might have spared many of those which he calls Errors, and not fasten upon those ancient Sages from whom we have our knowledge, more Errors then they were guilty of. For this and many more which he calls Errors, being brought to the Test, will be found Truths: But he is not guilty of this fault alone; some have shewed the way before him. It is then most certain, that the Bears send forth their young ones deformed and unshaped to the sight, by reason of the thick membran in which they are wrapt, which also is covered over with so mucous and flegmatick matter, which the Dam contracts in the Winter time, lying in hollow caves without motion, that to the eye it looks like an unformed lump. This mucosity is licked away by the Dam, and the membran broken, and so that which before seemed to be informed, appears now in its



right shape. This is all that the Ancients meant, as appears by Aristotle (*Animal. l. 6. c. 31.*) who says, that in some manner, the young Bear is for a while rude, and without shape. Now upon this to infer, that the Ancients meant the young Bears were not at all formed or articulated, till they be licked by their Dams, is ridiculous: For who will say those wise men were so ignorant, as to think the outward action of the tongue could perform that which could not be effected by the plastick and formative power in the matrix? Doubtlesse the Ancients were no lesse curious in searching into the natures of things, then we are at this day; but if I should yeild that the cub is not perfectly articulated or formed, till it be excluded, no Error will arise hence; for the plastick faculty which hath its original from the sperm, ceaseth not to operate after the generation of the young animal, but continueth working so long as it lives: For what else is nutrition but a continual generation of the lost substance, though not in whole, yet in part, and consequently it introduceth still a new form by changing the aliment into flesh. As the same Mason can build an house and repair it when decayed: so can the same plastick faculty produce the animal by generation, and repair it by nutrition. I confesse it is not called the *Plastick*, but *Omoïastick*, or assimilating faculty in nutrition, yet it is the same still, though under different names: nay, it doth not cease to produce those parts after generation out of the matrix, which it could not doe within it; as may be seen in the production of teeth in children, even in the seventh year of their age, which can be nothing else but the effect of the formative faculty. We see also how new flesh is generated in wounds; not to speak of the nails and hairs which are produced by the same faculty, not being properly parts. Besides, the faculty cannot perish so long as the soul is in the body, being an essential property which cannot be separated from the soul. Moreover, we see in some creatures, that this faculty doth not work at all in the matrix, but without: For the Chick is not formed of the Egg whilest it is within the Hen, but when it is excluded. Hence then it appears, that if the Ancients had held the young Bears to be ejected without form, which afterward they received by the *Plastick* faculty, had been no Error: and though some young Bears have been found perfectly formed in the womb of the Dam, it is a question whether all be formed and shaped so.



CHAP. V.

1. Divers priviledges of Eunuchs: The Fibers Testicles. 2. Diversities of Aliments and Medicaments, the vertue of Peaches, Mandrakes, the nature of our aliments. 3. A strange story of a sick Maid discuffed, and of strange vomitings, and Monsters, and Imaginations. 4. Men long lived; the Deers long life asserted. 5. That old men may become young again, proved.

THE Testicles were made for propagation of the Species, not for conservation of the Individuum: for Eunuchs, or such as are emasculate, have divers priviledges which others want: First, they are longer lived, because they have more radical moisture, which is not wasted by Venery: Secondly, they have taller bodies for the same reason: Thirdly, they are not troubled with so much hair, because they have not much siccity; and consequently not so much heat, which begets siccity. Fourthly, they are not subject to baldnesse, because their brain is not dried with Venery as others. Fifthly, they are not afflicted with the Gout, which is the daughter of Venus, who begets crude humours, weaknesse of joints, and of them the Gout: But Capons are more gouty then Cocks, because they have lesse heat, and are more voracious, saith Scaliger. Sixthly, they are fitter for spiritual exercises: therefore some, saith Christ, have made themselves Eunuchs for the kingdom of Heaven; which words were mis-construed by Origen, such as emasculated themselves, against whom are both the Canon and Civil Laws. Seventhly, they are fitter to be Counsellors and Chamberlains to Princes; for they are wise, therefore Eunuchs is as much as *ἐν νῶν ἔχειν*, as Scaliger hath it, *ἐν νῶν ἔχειν*; because they had care of the Princes bed-chamber. Eightly, the flesh of castrated animals is more delicate, because there is in them more benigne juicc, neither is their flesh infected with the ungrateful and rankish relish of the Testicles. Ninthly, but the greatest priviledge of all is, that they are not infected with the venomous vapours of that cave neer Aleppo or Hierapolis, which as Dio sheweth in the place of Trajan, poisons all creatures except Eunuchs. Scaliger gives no reason of this, nor can I, but that it is a secret in nature, or else because the Eunuchs bodies have very few bad humours, are the lesse apt to be infected with ill vapours. Tenthly, that as among men, so among beasts, there be some which castrate themselves;



such is the Fiber, called *Castor à castrando*, and the Pontick Dog, for there be store of them, who makes himself an Eunuch, saith *Juvenal*.

Dr. Brown, (sect. 12.) checks the Ancients for this opinion, but without cause; for all agree, that they bite off the two bags, or bladders, which hang from the groin in the same place where the Testicles of most animals are. If these be the true Testicles or not, is doubted, because there is no passage from them to the yard, and that the true Testicles are less, and lie inwards towards the back. However, this can be no Error, because they are a kinde of Testicles, both in form and situation, and so they are called Testicles by *Dioscorides*, and the best Physicians: if then this be an error, it is nominal, not real.

II. As our bodies are still decaying, and subject to many infirmities, so God hath provided for us all sorts of remedies, partly, by aliments, partly, by medicaments, some whereof are hot, some cold, some moist, some dry, some restraining, some laxative, some diuretick, some hypnotick, some spermatick, some increasing or diminishing the foure humours of our bodies, blood, choler, flegme, and melancholy.

Now those aliments are called Spermatick, which either increase blood, for of this the Sperm is begot, or which convey the Spermatick matter to the Seminal vessels; or which adde vigour to the languishing Seminall Spirits; such are sharp, biting, salt, aromattick and flatulent meats: or lastly, such as cause fecundity, by bringing the matrix and Seminall parts to a temperature by their contrary quality: So cooling things correct the heat, and hot things the coldnesse of those parts: among such the Mandrakes are to be reckoned, called by *Plutarch*, *Anthropomorpoi*, and *Semihomines* by *Columella*, because the forked root represents the lower parts of man, the upper parts are commonly carved out by circumforaneous Medagasters. These Mandrakes are of a narcotick quality; therefore a dull, heavy, or melancholick man of old was said proverbially to have eaten Mandrakes: These procure fecundity by correcting the hot matrix with their frigidity.

Now if we say, that *Rachel* finding her barrenesse to proceed from excessive heat, did covet these Mandrakes to cool her, and make her fruitful, this can neither be thought immodesty in her, nor an error in us to think so, seeing the best and most Interpreters are of this opinion, and the Text seems to intimate so much.



Dr. Browns reasons are not sufficient to prove this a vulgar error, (*Book 7. c. 7.*) For, 1. Though our Mandrakes have not so pleasant a smell as those of *Judea*, it will not follow they are not the same; for plants according to the climat alter their qualities; and yet *Lemnius* saith, they have a pleasant smell in *Belgium*. 2. Nor will it follow, that *Dudaim* is not Mandrakes, [because it is by the *Chaldee* Paraphrast interpreted in the *Canticles*, *Balsam*] for all Interpreters upon *Genesis*, expound the word *Mandrakes*. Nor 3. Is that sequel good [the Mandrakes did not make *Rachel* fruitful in three years after, therefore they did her no good at all in way of secundity] for the best Physick doth not produce the wished effect always in a short space; sometimes the contumacy of the disease, sometimes the mis-application, sometimes the disusing of the remedy, sometimes bad diet, besides other things, may hinder the operation. Nor 4. Is this consequence valid [Many Simples in Scripture are differently interpreted, *Ergo*, the word *Dudaim* may not signifie Mandrakes.] I answer, they may signifie as well as they may not; nay, they do signifie Mandrakes, as both the Hebrew, Greek, Latine, Italian, Spanish, French, English, and other Texts have it, besides the general consent of Expositors upon that place, except the *Genevans*, who would seem to be singular in this, and therefore will have the word *Dudaim* to signifie any lovely or delightful fruit; but then it may signifie Mandrakes, which are every way lovely both in smell and colour; and lovely they are in that they procure love; for they have been used for *Philters*: And what a weak reason is this, *Dudaim* signifieth any pleasant fruit, therefore it is a doubt, whether it signifieth Mandrakes? As if wee should say, *Pomum* signifies any kind of fruits, therefore it may be doubted, whether it signifieth an Apple. To be brief, I would know, whether it be a greater error in me to affirm that which is doubted by some, or in him to deny that which is affirmed by all.

But to return to our aliments, there are in them two things strange; first, that they are opposite to our natures, both privately, in that they have not our form; and positively, in that they have a contrary form; as we see in marrow, which is the aliment of the bones, the one being soft and moist, the other hard and dry; and if it were not so, there could be no action: But this is to be understood before assimilation; for afterward the same becomes both our aliment in repairing what is lost, and a part of our bodies in assuming the form



of our substance, which is no lesse strange then the other.

III. *Zacuta* (*de Prax. mir.* l. 3. *Obs.* 139.) reports a strange story of a Maid which fell into convulsion fits, upon the pricking of her Image by Witches, and their whispering of some magick words to it; the Physitians were sent for; they supposing these fits to proceed from some malignant vapour or humour in the Matrix, gave her physick, which made her worse then before; hereupon they left her, concluding that she was bewitched. Afterward she fell to vomiting of black stufte mingled with hairs, thorns, and pins, and a lump like an egge, which being cut, was full of Emmets, which stunk horribly: at last, she vomited out a black hairy creature, as big as ones fist, with a long tail, and in shape like a Rat, which ran up and down the room a while, and then died. Upon this a Wizard is called, who by whispering some words in the maids ear, and by shaving of her head, on which she put a piece of white paper, having these two letters written on it, T.M. did withal lay on her head an Asses hoof half burned, and so the Maid recovered.

I observe here, 1. That there might be much juggling in this business; for there is no relation or sympathy in nature between a man and his effigies, that upon the pricking of the one, the other should grow sick, no more then there is between the sword and the wound, that the dressing of the one should be the curing of the other. This is a fancy without ground, and yet believed by som whose faith is too prodigall. I think rather that after the Maid fell sick, these Jugglers made her Image, and then pricked it, so that the wounding of the Image did not make the maid sick, but her sicknesse made both the Image and the wounds therein.

2. This vomiting also might be an illusion; for I have seen in *Holland* the like forgery: It was given out that a maid in *Eyden* did vomit buttons, pins, hairs, peblestones, and such stufte; and I went and saw the materials; but it was found out that the parents had first made her swallow these things in meat, and then presently forced her to vomit all up again.

3. These convulsions and vomited stufte might be meerly natural, without any Witchcraft; for we have seen what strange sorts of vermin are bred in mans body, and voided by purging, vomiting, and boils; what unshapen and monstrous creatures have been produced by some women.

*Parry* tells us (*l. 25. de monstis*) of a Monster with an horn on



on his head, two wings, a childes face, one foot onely like a birds leg, with one eye on the knee, born at *Ravenna* 1512. *Lemnius* speaks of a woman that was his patient, (l. 1. de mir. c. 8.) who first was delivered of an unshapen masse of flesh, having on both sides two hands like a childes arms; and shortly after there fell from her a Monster with a crooked snout, a long neck, fiery eyes, a sharp tail, and mans feet, which ran up and down the room, making an horrible schrieeking till it was killed by the women.

I could speak of that *German* childe, in whose head grew a golden tooth, and of many other strange effects of nature; but these may suffice to let us see all is not Witchcraft which is so called.

4. This imaginary cure of the Wizard was effected after the humours were spent, and the malignity of this disease gone; at that time a piece of paper, or a straw, may doe more then all the sons of *Æsculapius*; but had the Wizard used this spell in the beginning of the disease, it had done the maid no good at all: when nature hath mastered a disease, that which is last applied, be it but a chip, carrieth away the honour of the remedy.

5. The maids imagination might be a great help towards her recovery, the force whereof is powerful both for curing and procuring of diseases. *Montague* in his *Essays* (l. 1. ca. 21.) tells us of one with whom the Clyster pipe applied to the fundament, would work as well as if he had taken the Clyster it self: And he speaks of a woman, who imagining she had swallowed a pin, as she was eating a piece of bread, cried out of a great pain in her throat, and a pricking, when there was no such thing but her own imagination, nor could shee have any rest, till she had vomited up all in her stomach; then searching the bason, she found a pin, which the Physitian had conveyed thither; and so the same conceit that brought the pin, removed it.

IV. In some Regions men live longer then in others, because the aire is more temperate, the influence of the stars more benigne, and the food wholesomer, by which the radical moisture and natural heat are longer preserved. In the Torrid and Frigid Zones men are short lived, because the natural heat of the body is drawn out by the ambient heat of the one, and extinguished by the cold of the other: but this is where the heat and cold are in the excess.

So likewise in the same Region we finde some men longer lived



lived then others, because they abound more in radical moisture and natural heat then others; besides, temperance in diet, exercise and passions are great helps for prolonging of life.

In *Orkney, Shetland, Norway*, and other *Septentrional* places, men live till they be six or sevenscore years of age. And *Leirius* (in *Navigat. Brasil*) shews, that in *Brasil*, which is a hot countrey, some doe attain six score years without gray hairs. *Pliny* l. 7. c. 49.) speaks of divers in *Vespasians* time in *Italy*, of 120, 130, 140, 150 years old: and it stands with reason, that man should not be shorter lived then other animals, being of a more excellent temper then they, having also dominion over them, and being made for a more excellent end, to wit, contemplation, wisdom, knowledge, for the finding out of Arts, and Sciences: Therefore God permitted the Patriarchs before the Flood to live so long as they did.

Now we finde, that divers beasts lived beyond an hundred years; *Ælian*, *Pliny*, and others affirm, that Elephants live two hundred years: Deer exceed an hundred years, as *Pliny* shews by those Staggs that were found with Brasle collars about their necks, which *Alexander* had put on an hundred years before.

This story is rejected by *Dr. Brown*, (*Book 3. ca. 9.*) upon weak grounds: 1. [Because Deer attain to their full growth at six years, therefore their state and declination which ought to be proportionable to the growth, cannot be of long continuance. 2. Their immoderate salacity in the Moneth of September. And 3. Their losse of teeth between twenty and thirty, which is an infalible mark of old age.]

These are feeble reasons to deny an ancient story, or matter of fact: For, 1. Nature doth not observe that imaginary proportion between the growth and decay of things; for some tame birds which attain their full growth in three or four months, have lived twenty years after: and men, who have their full growth at 25 years, have lived two or three hundred years. 2. Salacity for one moneth in the year, cannot argue a short life, as it doth in Sparrows, who are salacious every houre; nay, almost every minute: For *Scaliger* observed a Cock-Sparrow tread the Hen ten times in a few minutes. 3. Nor is the losse of teeth an argument of short life; for many after this losse have lived 60 or 70 years. And it is observed by *Scaliger*, that the drinking of cold water, which is an enemy to the nerves, causeth the falling away of



of the teeth : therefore I will content my self with the report of *Pliny* concerning the Deers age, till I have better reasons then these.

V. It may be questioned, whether old men may become young again ; and I am of opinion they may : not that the years past can be revoked, or that which is done, undone ; for *Evanders* prayer in the Poet was in vain :

*O mihi præteritos referat si Jupiter annos.*

But that the decayed nature may be so renewed and repaired, as an old man may perform the functions of a young man, and may say with *Tully*, *Nihil habeo quod accusem senectutem meam.* This the Poets expresse under the fiction of *Eacchus* his Nurses, and of old *Æson* made young again by *Medea*. It stands alio with reason : For,

1. Serpents by casting off their old skins, renew their youth and vigour ; and Stags do the like by eating Serpents, *Languescunt in juventutem, Terul. de Pallio.* Why then may not man be renewed?

2. Every fit of sicknesse is like old age : men in a long *Ague* differ nothing from the most decrepid and aged persons that are : But being recovered, they obtain a youthful vigour and agility.

3. The radical moisture when it is much decayed, either by famine or sicknesse, may be again repaired, and consequently the youthful vigour of the body.

4. *David* saith, (*Psalm 103. 5.*) that his youth is renewed like the Eagles. Now the Eagles, as *Saint Austin* observes on that place, when with age the upper Bill is so over-grown, that they cannot feed, they use by beating their Bill against a rock, to break off the excrescence, and so by feeding recover their strength and youth again.

5. For this end God created the Tree of Life in Paradise, that when mans radical moisture fails, it might be repaired again, and his youth be renewed by eating thereof.

6. Divers examples we have of this renovation. *Del Rio* (*de Mag. l. 2.*) sheweth out of *Torquenda*, that in the yeare 1511, was an old man at *Tarentum* of an hundred years old, who having lost his strength, hairs, nails, and colour of his skin, recovered all again, and became so young and lusty, that he lived fifty years after : Another example he brings of a *Castilian*, who suffered the same change ; and of an old *Abbate* in *Valentia*, who being decrepid, suddenly became young, her monethly courses returned, her rugged skin grew smooth, her



her gray hairs became black, and new teeth in her head.

*Massæus* in his *Indian History*, (lib. 1.) speaks of a certain *Indian Prince*, who lived 340 years, in which space his youth was three times renewed. Besides *Cardan*, *Langius* in his *Epistles*, (Epist. med. 79.) speaks of a Well in an Island called *Bonica*, the waters of which being drunk, makes old men become young.

*Ambrose Parry*, (l. 24, 17.) speaks of a woman who being 80 years old, lost her hair and teeth, which grew again. I have read of divers women whose intermitted courses have flowed when they were 70, 80, 90, 100 years old.

#### CHAP. VI.

I. Of many new diseases, and causes thereof. 2. Different colours in our bodies: the causes of the *Ethiopian blackness*. 3. The true *Unicorn* with his horn and virtues asserted. 4. Some born blind and dumb, recovered: A strange *Universal Fever*: A strange *Fish*, and strength of *Imagination*.

THAT in all Ages some new diseases have invaded mens bodies, may appear by these testimonies: *Thycides* (l. 2. de *Bel. Pelopon.*) speaks of a new pestilence in *Athens* never heard of there before.

*Agitharchidas* (de mari rubro) writes of the inhabitants about the red Sea, in whose flesh vermin was bred like little dragons, which consumed their flesh; sometimes they would thrust out their heads, and being touched, pull them back again: they made great inflammations in the musculous parts: This mischief was never heard of before; one amongst them being troubled with a *Dysury*, voided at last a stalk of *Barly*: At *Athens* a youth with his urine voided a little beast with many feet.

*Pliny* tells us, that the *Mentagra*, or Tetter of the Chin and Face, was not known in *Rome* till the time of *Tiberius*: The Carbuncle came to *Rome* in the Censorship of *L. Paulus*, and *J. Marius*: The Leprosie called *Elephantiasis*, appeared first in *Italy* in the time of *Pompey*; He speaks also of other diseases, which not long before his time sprung up in *Italy*: A kind of Fever, called *Coqueluche*, by the French, invaded their country,



country, anno 1510. England was plagued with a new sweating sickness, anno 1529: The French malady appeared first at Naples, anno 1492. The *Scorbutus* is but a new disease in those parts. Many strange kinds of vermin have been bred in mens bodies in this last Age, not known before in this part of the world: Of these and many more new diseases *Fernelius*, *Fracastorius*, *Sebizius*, and others do write.

Now it is no wonder, that there are new diseases, seeing there are new sins. 2. New sorts of foods and gluttony devised. 3. New influences of the Stars. 4. New Earthquakes and pestiferous exhalations out of the Earth. 5. New temperaments of mens bodies. 6. Infections of waters, malignant meteors, and divers other causes may be alledged for new diseases; but none more prevalent then the food which is converted into our substance: therefore in eating and drinking, wee should regard the quantity, quality, and seasons.

II. It is strange to consider the diversitie of colours caused in the same Individual body of man by the same heat; the chylus, milk, sperm, and bones, are white; the blood and liver red; the choler yellow; the melancholy green, the spleen blew, a part of the eye black, the hairs of divers colours, and yet none blew or green. And as strange it is, that in some the skin is tawny, in others white, and in others black, all which is effected by one and the same Sun, which as it produceth all things by its heat, so it giveth colour to all things; for what giveth the essence, giveth also the consequences; yet *Dr. Brown* (*Book 6. c. 10.*) will not have the Sun to be the cause of the *Negro's* blacknesse, 1. [ Because the people on the South-side of the River *Senaga*, are black, on the other only tawny. 2. Other animals retain their own colours in that clime. 3. In *Asia* and *America*, men are not so black. ] I answer, that it will not follow, that the Sun is not the cause of blacknesse; for he doth work upon each Subject according as it is disposed to receive his impression, and accordingly produceth diversity of colours. Hence in the same hot climat men are black, Parrets and leaves of trees are green, the Emets as some report, are white, the Gold is yellow, and every thing there hath its own peculiar colour; and yet all are produced by the same Sun; nay, the same man that hath a black skin, hath white teeth; the same Sun at the same time in the same Garden, doth cloath the Lily in white, the Rose and Cherry in red, and divers fruits in black: it is observed, that the



the Sun whiteneth those things which are inclined to be hard, and blackneth soft things; so he makes the *Ethiopians* teeth white, the skin black; he makes the green corn turn white and hard with his heat, and at the same time makes the plumb black and soft; women that blanch or whiten their linnen in the Sun, know that he can tan their skins, but whiten their cloth.

Again, the air may be more temperate, and greater store of refreshing windes and exhalations on the one side of the river *Niger*, then on the other, and so the Suns operation may bee hindred, which is the cause that in *America* and *Asia*, under the same parallel, men are not so black as in *Africk*, where there is more heat and greater drought: For it wants those fresh Winds, and great Lakes and Rivers which are in *Asia* and *America*. The Suns heat then is the cause of blacknesse in such as are capable of it, whether the clime be torrid or frigid. Hence in cold countries we finde black crows, and in hot white Swans. Besides, this narration is suspicious; for on both sides of the River men have been seen equally black; and there be some in *Asia* as black as in *Africa*. He objects again, [That *Negro's* transplanted into cold countries, continue their hue, therefore the Sun is not the sole cause of this blacknesse.] *Ans.* The question is not if the Sun be the sole cause, but whether a cause at all; which the Doctor in his former objections seemed to deny. 2. I say, that the Sun is the sole primary cause; if there be any other causes, they are secondary and subordinate to the Suns heat and influence. 3. Hee may as well infer, the Sun is not the cause of greenesse in leaves, grasse, or plants in the Torrid Zone, because these being transplanted into cold climates, retain their hues, [Book 6.c.12] And indeed he seems to make the spirit of Salt peter in the Earth the cause of viridity, because [in a glasse these spirits project orient greens.] I should like his reasons well, if the verdure of the plant were not more real then that of Salt-peter in the glasse; but what will he say to that Earth where is no Salt-peter at all, and yet the hearbs are green? Or is there Salt-peter in a glasse of pure water, where I have seen green leaves bud out of the stem of an hearb. Besides, I finde urine out of which Salt-peter is made, to spoil the greenesse of the hearbs. 4. If the impression of black, which the Sun causeth in a hot clime, must alter in a cold, then may the other qualities also which the Sun by his heat procureth, be lost in a cold countrey; and so what is hard in *Ethiopia*, must bee soft



soft in England, and the heat of Indian spices must here grow cold. He objects again, [that there are *Negroes* under the Southern Tropick, and beyond which are colder countries.] I answer, that these *Negroes* were colonies out of hotter countries, and not Aborigines or Natives at first: And he confesseth there be Plantations of *Negroes* in *Asia*, all which retain their original blacknesse. Lastly, he objecteth, [That in the parts where the *Negroes* possesse, there be rivers to moisten the air; and in *Lybia* there are such dry and sandy desarts, as there is no water at all, but what is brought on camels backs; and yet there are no *Negroes*; therefore driness cannot cause blacknesse.] I answer, 1. It cannot be proved, that the *Negroes* who dwell neere rivers, had their originall there. 2. Though there may be some moist exhalations, yet it seems they are not so abundant as to qualifie the Suns heat. 3. Though the desarts of *Lybia* be dry, yet they are not so hot as under the Line: It is the excesse of heat and ficcidity together, that causeth blacknesse, and not one of these alone. 4. We see men grow tauny here by conversing much in the Sun; And further South more tauny, and still as the heat increases, the degrees of blacknesse increase also: to deny this, were to deny our senses; and we see dead bodies hung in the Sun, grow black; the same would befall to living bodies, if they continued still in the Sun, yet not in so short a time, because the continuall generation of moisture, and the supply of the decayed parts would make some resistance; yet *Pausanias* tells us, that the *Lybian* vipers are black by the Suns heat; therefore saith *Cardan*, there is no more reason why men should be black there then vipers, *l. 10. de subtil.*

III. Mens bodies are obnoxious to many dangers, by reason of the many sorts of poisons in the world, some killing by occult, some by manifest qualities; but God out of his goodnesse to mankind, hath ordained as many remedies and antidores as there be poisons, whereby their malignity is either prevented or expelled: Among all these Antidotes, there is none more wonderful then the Unicorns horn, which hath been so much questioned and doubred by divers Writers, some denying the existence of the Unicorn as it is ordinarily painted & described; Others denying that there is any such horn, and some disallowing the vertues thereof; among whom is Doctor *Brown* (*Book 3. c. 23.*) in his *Vulgar Errors*: But that there are Beasts with one Horn in the *Indies*, as Bulls, Asses, Horses, &c. I think none will deny. 2. The Unicorn or *Monoceros*, is not the



the same with *Rhinoceros* or *Naricorn*: for this is of an Elephantine bignesse, vvith short legs, vvwhose bodie is covered vvith shels, the Elephants enemy, which he overcame at *Lisbon*, that publick combat exhibited by *Emanuel* of Portugal, an 1515. he hath a short Horn on his shoulders, another longer on his nose; but that *Rhinoceros*, vvwhose picture *Scaliger* saw, (*Exerc.* 205.) had an head like a Hog, with two horns, one upon his nose, the other upon his forehead, called by *Martial*, (*in Amphit. Epig.* 22.) *Ursus geminus cornu gravis*. But the true Unicorn hath the proportion and bignesse of a Horse, the head, legs and feet of a Stagge, and the mane of an horse; he hath a horn in his forehead, saith *Cardan* (*de subtil.* l. 10.) three cubits long; two of these Unicorns vvvere seen at *Mechia*, of vvwhich see *Parry* in his 21 Book of poisons, *Munster* and *Fernandus de Cordova*, [*l.* 5. *didasc.* c. 9.] 3. The reason why the Unicorn is differently described, is, because divers Authors confound him with the *Naricorn*, or else because there be divers species of Unicorns, as there be of Dogs and other Animals, or else because they vary the colour and bignesse of their horn according to their age and climat wherein they live, as other beasts doe: but from variety of descriptions and circumstances, we must not infer a nullity of the substance, as *Parry* doth; for so wee may deny the *Rhinoceros*, which is diversly described; *Strabo* makes him like a Bear, [*li.* 15. *de sub.* l. 10.] *Cardan*, like a Bull, others like an Elephant. [See *Parry*, *Cardan*, *Fern. de Cord.* *Pausanias*, *Scaliger*, *Munster*, *Pliny*, *Solinus*, *Cesar*, *Aelian*, *Polyhistor*.] Some give him but one horn, some two, which with some is crooked, with others straight. I therefore make no question of the true Unicorn, as he is commonly painted, because *Vertomanus* saw two of them, as *Scaliger* witnesseth, and so did *Lewis Barthelema*, who as some say, is the same with *Vertomanus*, *Justin Martyr*, *Basil*, and other of the Fathers; Yea, the holy scriptures seem to favour this description, *Job* 39. 9. *Will the Unicorn be willing to serve thee, &c?* The Hebrew word *Rem* is by *Hierom*, *Montanus*, and *Aquila*, translated *Rhinoceros*; but by the 70 *Menoceros*. Yet in another place *Hierom* and *Montanus* translate the word Unicorn: and in this place it cannot signifie *Rhinoceros*, because this beast hath been oftentimes subdued by man, and bound, as we read in the Roman stories, but so was never the Unicorn brought into subjection, as God sheweth to *Job*: And when *David* saith, *He shall be exalted like the Horn of an Unicorn*, he cannot mean the *Rhinoceros*, who



of all cornuted Animals, hath the shortest Horn; but the true Unicorn, whose Horn is the highest of all others; for else Davids comparison had been childish. Now for the Horn it self, and vertues thereof, they are rejected by *Rondeletius*, *Parry*, *Brown*, and some others. *Rondeletius*, [l. 21. de venenis, c. 61.] found no more vertue in this Horn then in an Elephants Tooth. *Parry* found no vertue in the French Kings Horn. *Brown* rejects the Horn, [because it is diversly described. 2. The Ancients adscribed no vertue to it. 3. It cannot resist Arsenick, and poisons, which kill by second qualities.] To these I answer, 1. If it be sufficient to deny an Horn, for that it is differently described, we may deny the Harts Horns, for there are great differences of them, some bigger and higher then others, some more branchy, some harder, some are cloathed with a soft Doun, others are not; and they have not all of them exactly the same colour. Neither do I allow, that all which are called Unicorns horns, are true; for some are fictitious. 2. If the Ancients adscribed no vertue to this horn, why was it of such account among them? Why did the *Indian* Princes drink out of them, and make Cups and Rings of them, which either they wore on their fingers, or applied to their breasts, but that they knew there was in them an antidotal vertue against poison, as *Andreth Baccius* [l. de Unicorn.] sheweth, and the Doctor denieth not [an Antidotall efficacy, and such as the Ancients commended in this Horn] and yet two lines before, [he denies that the Ancients adscribed any vertue to it.] But sure it is apparent, that not only there is an occult quality in it against poison, as in the *Elks* Hoof against the falling sicknesse, but also by manifest qualities it works; for *Baccius* proves it to be of an excessive drying quality, and therefore good against worms and putrefaction. And that *Riccus* the Physitian did use sometimes the weight of a scruple, sometimes of ten grains thereof in burning fevers with good successe. 3. That it can resist Arsnick, the same *Baccius* proves, by the experiment which the Cardinal of *Trent* made upon two Pigeons, [l. de Unic.] to which he caused some Arsenick to be given: shortly after he gave some serapings of his Unicorns horn to one of them, which after some symptomes recovered and lived, the other died two hours after it had eaten the Arsenick: The same Horn cured divers pestilential Fevers, and such as were poisoned. Hence then it appears, that this Horn was both commended by the Ancients, namely, by *Ælian*, *Philostates*, and divers others, as also by modern



dern Physitians, as *Ficinus*, *Brasavolus*, *Matthiolus*, *Mandella*, and many more. It is true, that some might not find the vertue of it, either because it was not the true Horn, or the true dosis was not exhibited, or due time was not observed, or else the malignancy of the disease would not yeild: For *Interdum docta plus valet arte malum*. But from hence to deny the Horn or its vertue, were all one as to deny Rhubarb, Agarick, Sena, or other Simples, because they do not always produce the wished effect, or work upon all bodies at all times alike. The means to discriminate the true Unicorns horn from the false, are two, to wit, if it cause the liquor in which it is put, to bubble; and secondly, if it sweat when the poison is near it, as *Baccius* tells us.

IV. I have read of some who were born blind and dumb, and yet have been cured, [*Seidelus de morb. incur.*] but in these there could not be a totall privation of the organ or faculty of sight and speech; for such cannot be cured by Nature nor Art. And so *John 6.* it was held impossible for one born blind to see. In those then was only a privation of the act, and so the eye-lids only shut up and agglutinated, which by Art might be cut and opened. And so the strings by which the tongue is tied, are often cut. I have also read [*in Seidelus*] of one who lived till he was an old man, and every year from his birth till his dying day, had a fever which took him still upon his birth-day: This anniversary Fever held him still fourteen days, and at last killed him. The seeds of this Fever he got doubtlesse in his mothers womb: and what impressions the seed or Embryo receiveth then, can never be eradicated; such is the force of the formative power upon our first materials. *Scaliger* speaks of a certain Fish in the Island of *Zeilam*, which if one hold fast in his hands, puts him in a shaking fit of an Ague: This effect I suppose proceeds from the excessive cold of the Fish, which by the hand being communicated to the muscles and nerves, causeth shaking and convulsion fits. And no lesse strange is that which is mentioned by *Libavius*, of one who hearing his kinsman being in a remote country, was dead of the plague, fell sick himself of the same disease, though the place where he was then dwelling, was free from any infection. [*Libavius de veneno, c. 8. Corollarii*] This proceeded from a deep apprehension, or sudden fear, a weaknesse in nature, and an aptitude to fall into that disease; and how powerful apprehension, fear and fancies are upon our bodies, may be seen in that story mentioned



tioned by *Libanius* [*de veneno. c.8.*] of one who ate a snake in stead of an Eel without any hurt, till a good while after he was told it was a Snake; and upon this he fell sick and pined away.

CHAP. VII.

1. The diversities and vertues of Bezar stones. 2. A woman conceived in a Bath, of an Incubus. 3. Strange actions performed by sleepers, and the causes thereof. Lots Incest in his sleep. 4. Some Animals live long without food: The Camelions food is only air; the contrary reasons answered: Air turns to water, and is the pabulous supply of fire.

**M**Onardes [*in historia Bezoaris*] speaks of some who were poisoned by drinking out of a puddle where Toads, Snakes, and other virulent vermin had laid their spawn, but were cured by taking Bezar two or three times. *Bauhinus* [*c. 34.36.*] speaks of divers diseases cured by this stone; and it is known by daily experience, that it is used with good successe in pestilential Fevers, as *Synertus* shews, *Syn. l.4. de Feb. c.8.* It is also good in divers other maladies both to cure and prevent them: Yet Doctor Brown thinks [*we are daily gulled in the Bezar, whereof many are false, Book 3. c. 23.*] I deny not but some adulterat Bezars there are, yet we must not think all fals, or that we are gulled, because we do not see the wished effects: For *Synertus* (*l.4. de Feb. c.8.*) shews, that the best Bezar faileth, if the just dose be not given. For some out of fearfulness give but a grain or two, whereas he hath given eight or ten grains with good successe. Again, the operation of it is hindered oftentimes by mixing it with other Simples: It proves also ineffectual, if any thing else be given too soon after, or if the stomach be not clear when it is exhibited. For as the spirit of Tartar and Vitriol by themselves will work powerfully; but being mixed, lose their operative qualities and taste: so doth Bezar many times mixed with other things. Now this stone is bred in a bag under the stomach of some beasts, which in form resemble our Goats: In the East-Indies they have horns, but in the West none: The Oriental stones are the best, a grain whereof hath been sold for four Ducats. Some of them are as big as a Goose Egg: they have divers forms, and divers colours,



lours, some yellow, some green, some black; the best are bred in those beasts that feed on the hills, and on aromatick hearbs, which are not found in the valleys: they grow like Onions wrapt about with many tunicles or crusts. *Acosta* (l. 4. c. 42.) sheweth, that in the midst of some of them are found pins, straws, or sticks, about which matter doth gather, vvhich by degrees increaseth and hardneth till it come to a just magnitude. In the midst of those stones are found sometimes odoriferous hearbs. *Mathiolus* and *Renodæus* hold those for the best stones in the midst of which are found dust or gravel. The *Indians* use the pouders of *Bezar*, not only against inward diseases, but also with it they cure their wounds and Carbuncles, or Boils. *Acosta* (l. 4. c. 42.) relates the observation of the *Petrans*, vvho say, that the best stone is bred in a beast called *Vicugne*, vvhich feeds upon a poisonable hearb, by which it preserves it self from the grasse, and vvaters that are poisoned by venomous beasts. He that will see more of this stone, let him read those above named, and likewise *Bontius*, *Baccius*, *Toll*, and others.

11. That story is strange of the Woman vvhich conceived in a Bath by attracting the mans sperm vvho bathed in the same place: This is affirmed by *Averroes* (*Anat. l. 8. quest. 11.*) but denied by *Laurentius, del Rio*, and some others, vvhom Doctor *Brown* in this followeth. Hee that denyeth a matter of fact, must bring good witnesses to the contrary, or else shew the impossibility of the fact, vvhich they do not. For we shall find this conception possible, if either we consider the nature of the Matrix, vvhich by a strange instinct and appetite attracteth the sperm to it (for vvhich cause *Plato* calls it (ζῶον ἐπιδυμνωτόν) even as the stomach attracteth meat and drink, though in some distance from it: Or if wee consider that the seminal spirits in the vvarm vvater might be a vvhile preserved from evaporating; and therefore vvhat they say of the longitude of the organ in vvhich the seed is refrigerated, is not to the purpose, except they could prove it to be so in all: But the contrary is found in the long organ of great breasts, vvherein the sperm is no vvays damaged. Besides, the heat of the bath might have some proportion to that of the Matrix; vvhereas the organ of emission is not so hot, as consisting most of nervous and spermatical parts. Again, vve see that the sperm of Fishes, in vvhich there are seminal spirits, is not prejudiced by the vvater vvhere it is shed; but the male fishes cast their seed upon the spaw vvhich the females leave in the vvater, as

Aristo-



Aristotle, Pliny, Ælian, Albertus and others, do shew. Lastly, wee must not think all the stories false vvvhich are vvritten of the *Incubi*, vvvhich vvvere evil spirits conveying the masculine seed to the place of generation, of vvvhich there have been conceptions. For to deny this, saith *Augustine*, (*lib. 15. de Civit. Dei, cap. 23.*) doth argue impudence, considering the many testimonies and examples of the same: yet I deny not but the imagination is sometimes deluded, but not still, as *Wierus* thinks; and I know also, that *Incubus* is the same disease vvith *Ephialtes*; yet it will not follow, that there are no evil spirits called *Incubi* and *Succubi*: For, to deny such, vvvere to accuse the ancient Doctors of the Church, and the Ecclesiastick Histories of falshood, vvvhich affirm that the *Catechumeni* vvvere much troubled vvith these *Incubi*. This vvvere also to contradict the common consent of all Nations, and experience. There is then a double *Incubus*, the one natural, called *ἐπιάλπις*, vvvhich is caused in sleep by a frigid grosse vapour filling the ventricles of the brain, and prohibiting the animall spirits to passe through the nerves, vvwhereby the imagination is hurt, so that they think they are oppressed vvith a great vveight. This disease is much like the *Epilepsia*, but somewhat milde. The other *Incubus* is Diabolical.

III. That some men can in their sleep perform those actions vvvhich they neither could nor durst do when awaked, is known by Histories and experience. *Marianus* (*cap. ad audientiam*) vvitnesseth, that he had a Maid, vvvhich in her sleep could rise and make bread, as if she had been awaked. *Francis Mendoza*, (*L. 6. de Flor.*) knew one vvvhich vvould rise in his sleep, and in the night time vvwalked out vvwith his naked sword, vvwith vvvhich hee struck some of the City guard; but at last being vvwounded, vvvas awaked. *Tirannel* (*in Mendoza*) speaks of an *English* man in *Paris*, vvvhich rose in his sleep, vvvent down vvowards the river *Sene*; vvwhere, having met vvwith a Boy, he killed him, and so returned (being all this vvwhile asleep) to his bed. *Horstius* (*de noctambulis*) vvrites of one vvvhich in his sleep usually vvould arise, go up and down the stairs, lock and unlock his chests. He speaks of another, vvvhich dreamed he vvvas to ride a Journey, riseth, puts on his cloaths, boots and spurs, gets up into the Window, vvwhere he sate stradling, beating the vvvals vvwith his spurs, till hee vvvas awaked. And he sheweth, that at *Helmstad* one rose in his sleep, vvvent down the stairs into a Court; from thence vvoward the Kitchen, vvwhere vvvhich vvvas a deep Well; into this he vvvent down, holding fast to the stones by his hands



and feet; but when hee touched the ywater, with the cold thereof he vvas awaked; and finding in what danger he was, gave a pitiful out-cry, which awaked those in the house, who having found him, got him out, and brought him to his bed, where he lay many days speechlesse and immoveable, being extremely weakned with fear, cold, and crying. Another story he hath no lesse strange then this, of a young Gentleman vvho in his sleep arose naked, carrying his shirt in his hand, and by the help of a rope clambers up to a high Turret in the Castle where he then was: Here he findes a nest of Mag-pies, which he robs, and puts the young ones in his shirt; and so by the same rope comes down again, and returns to his bed: The next morning being awaked, tells his brother how he dreamed that he had robb'd a Pies nest; and withal wondring what was become of his shirt, riseth and findes it at his beds feet, with the young birds wrapt up in it. To these examples, wee may add that of Lot, who in his sleep begot his two daughters with childe: This Dr. Brown (*Book 7.c.6*) will not admit, though he hath a direct Text of Scripture against him: For there it is said, *Gen. 19. That Lot neither knew when his daughters lay down, nor when they rose up.* Which words are expounded by Irenæus (*c. 51. cont. Hæres.*) *That Lot had neither pleasure, nor consent, nor sense, nor knowledge of this act:* Chrysostome affirms the same, expounding these words, *Lot* (saith he, *Hom. 44. in Genes.*) *was so intoxicated with wine, that he knew not at all what he did, lest he should be guilty of so great a crime; acting in this neither wittingly nor willingly.* S. Austin is of the same minde, (*Cont. manic. l. 22.*) and other Expositors. Now if one ask, how sleeping men can do such things? I answer, it is partly by the strength of imagination, which is more active in sleep then when we are awake. 2. All sleepers are not apt for such actions; but such whose natures are melancholy or cholerick, whose spirits are more fervent, subtil, and agile then others, moving the muscles, and by them the body, though the outward senses be bound up by sleep. 3. They catch not that hurt in their sleep, which they would do if awaked; because their senses are not avocated by other objects, they have no apprehension of fear, their imagination is more intent in sleep; and withal their Genius or good Angel is carefull of them.

*IV.* I read of divers both beasts and men, which have lived a long time without meat or drink: We know that Swallows, Cuckows, Dormice, & diuers other animals, fast all the Winter:

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The like is recorded of Lizards, Serpents, Water-Crocodiles, Bears, and other ravenous beasts, whose bodies by reason of their humidity and rapacity, are full of crudities, by which they are fed in the Winter. *Mendoza* (*de Flor. Philos. Probl.* 24.) speaks of a Hen in his time, which lived eighty dayes without food and vvater. *Cardan* (*de subtil.* l. 10.) writes, that the *Indian* bird called *Manucodiata*, lives only in the aire upon dew as Grashoppers do. *Rondiletius* (*l. 1. de Piscib.* c. 12.) shews, that his wife kept a fish three years in a glasse, without any other food but water; and yet the fish grew so big, that the glasse could not at last contain it. And I have kept Spiders my self in a glasse, which I dismissed after they had fasted nine months. The Camelion also liveth upon the air, *Oscitans vescitur, follicans ruminat, de vento cibis*, saith *Tertullian* (*in Pallio.*) I have seen a Camelion which was brought hither from *Africa* by sea, and kept in a box, which all the while was never seen to feed on any thing else but air. Yet *D. Brown* (*Book 3, c. 21.*) will not have air to be his food for these reasons: 1. Because *Aristotle* and *Ælian* speak nothing of this. *Ans.* Neither do they speak any thing against it, which likely they would have done, if they had thought their feeding on aire had been fabulous. They do not speak of what food each animal is sustained: and though they doe not speak of this airy food, yet *Pliny*, and others do. 2. *Scaliger* writes, that *Claudius* saw a Camelion lick up a fly from his breast. And *Bellonius* upon exenteration found flies in the Camelions belly. *Ans.* So I have seen Dogs and Cats eat Flies; Monkies and Turkies eat Spiders, and Dogs eat grasse; yet it will not follow, that they feed on these, but rather eat them out of wantonnesse, or for physick; so doth the Camelion sometimes eat flies; and so doth the Ostridge eat Iron, and divers birds swallow stones. 3. There are found in this animal the guts, the stomach, and other parts for nutrition, which had been superfluous if it feed on aire only. *Ans.* These parts are not superfluous, though they feed on air, but necessary; because the air on which they feed, is not pure, but mixed, and therefore nutritive. Again, they vvete to eat sometimes flies, for pleasure or physick, therefore the stomach was necessary. Moreover, we must not think every thing in nature superfluous, whercof vvee can give no reason; for so wee may accuse her for giving eyes to Wonts, tears to Men, Goats, and Dogs, whereof they make no use. And why she is so bountifull to the Fox, and so niggardly to the Ape, in giving the one too great a tail, the other none at



all. 4. He reasons *From the bignesse of the Camelions tongue, and the slimy matter in it, that air cannot be its nutriment.* *Ans.* Its tongue vvas made to catch flies, but not for nutriment, as is said: and that slimy matter is given as well for its prey, as for the destruction of Serpents its enemies: for it useth upon the sight of a Serpent, to let fall that slimy matter on his head, vvith which he is presently killed. 5. *The air cannot nourish, because it hath no taste.* *Ans.* Taste belongs not to nourishment; for they who have lost their taste, are not therefore the lesse nourished. Again, though the pure air be tastelesse, yet air thickned and moistned, is not so as we may perceive by the divers tastes in waters. Besides, though the air be tastelesse to us, it may be otherwise to the Camelion. 6. *There can be no transmutation of air into the body nourished, because there is no familiarity of matter between air and a living body.* *Ans.* This may be true of pure air, but not of mixed, and of our bodies, not of the Camelions. Besides, divers creatures live on dew, which is but watrish air; and how many in *Arabia* are fed with Manna, vvwhich is both begot of and in the air. 7. *Nutriment is condensated by the natural heat, but air by the bodies heat is rarified.* *Ans.* The contrary of this is seen continually by the air vve breath out, which is still thicker then that we take in; For though the heat doth rarifie the air, yet by the moisture of our bodies it is thickned. 8. *All aliment must remain some time in the body; but air is presently expelled.* *Ans.* The air which is attracted by the Lungs, and serves for refrigeration of the heart, is quickly again expelled, because it is to stay no longer then it performs its office, vvwhich is to refrigerate; but that air on which the Camelion and other creatures feed, must and doth stay longer. 9. *Air in regard of our natural heat, is cold, and so contrary; but aliment is potentially the same.* *Ans.* All aliment is contrary at first, or else there could bee no action, and so no nutrition. Again, vvhat is cold, is potentially the same vvith our bodies, in respect of the substance, not of the quality. Besides, how many sorts of cold meats, fish, fruits, hearbs, fallers, do men eat in Summer, vvwhich notwithstanding are the same potentially with their bodies. 10. *Some deny air to be an aliment, or that it entreth into mixt bodies, and its not easie to demonstrate, that it is convertible into water; and we doubt that air is the pabulous supply of fire, much lesse that flame is properly air kindled.* *Ans.* Some have denyed Snow to be white, or fire hot, therefore no wonder if some fantastical heads deny air to be an element, or that it entreth into mixt bodies. *Danaus* indeed thinks air and water to be all one, because water is quickly



ly turned into air, and because they have great affinity : but this is against himself ; for what can be turned into another substance is not the same, nothing is convertible into it self : and if air be water, because this can be turned into that, then water is earth ; for in many caves water drops turn to stones, and so we shall make but one element. Again, if air enter not into mixt bodies, what is that unctuous humidity or oyl which we finde in all perfect mixt bodies ? It cannot be fire nor earth ; for these are neither unctuous nor humid : nor can it be water ; for though that be humid, it is not unctuous, it must needs then be air. Again, when the Doctor saith, *It is not easie to demonstrate the conversion of air into water* ; he denieth both sense and reason : for this conversion is as demonstrable as our respiration in winter, when the air which a man attracteth, is turned into water drops on his beard, sheets, rugs, and blankets : reason also shews this ; for if water can be turned into air, why cannot air be turned into water, both communicating in the symbolical quality of humidity. Lastly, his doubting, and the Lord Verulam denying air to be the pabulous supply of fire, is causeless : For I ask, what is it that substantially maintains the fire ? They answer, *It is combustible matter in the kindled body*. But in this they trifle : for I ask what this combustible matter is ? Earth it cannot be ; for earth, i. as earth, is not combustible ; and we see that after the fire is spent, earth remains in ashes. Nor can it be water ; for that maintains not the fire, but extinguisheth it. It must then necessarily be air : for we see by daily experience, that the more of this unctuous or aerial humidity is in the fewel, the more apt it is to burn. And when this is spent, the fire dieth, as we see in candles, lamps, torches, links, and whatsoever hath pinguedinous matter in it. *Fernelius* indeed gives a threefold food to the fire ; to wit, combustible stuffe, smoak, and air ; but all this may be reduced to air : For nothing is combustible, which hath not in it aerial humidity : and smoak is nothing else but air cloathed with the fiery quality of ficcidity and calidity, wanting nothing but light to make it fire. Therefore we see how quickly smoak is turned into flame, and this into smoak again. To conclude, air is the very life of fire, which would quickly die, if it received not animation by ventilation. This we see in cupping-glasses, how nimbly the fire, when almost extinguished, will upon a little vent suck the air to it.



## CHAP. VIII.

1. Divers animals long-lived without food. The Camelion live, on air only. 2. Divers creatures fed only by water. 3. Chilification not absolutely necessary. Strange operations of some stomachs. The Ostrich eats and digests Iron. 4. How Bees, Gnats, &c. make a sound. Of Glow-worms: and Grains bit by Pismires: the vegetable Lamb, and other strange plants. 5. The Tygers swiftnesse. The Remora stays ships.

**T**HAT divers animals, even men and women can subsist without food, is plain by these examples: A certain maid in the Dioceſſe of Spire, anno 1542. lived three years without meat or drink. In the year 1582. in the Palatinat there lived a maid nine years together without food, who afterward married, and had children. Rondeletius (l. 1. de pis. c. 13.) writes of a maid in France, and of another in Germany, who lived divers years without food: and of another whom hee saw that had no other food but air ten years together. Ficinus saw a man who had no other food but what the air and Sun afforded him. In the year 1595. a maid lived at Colen three years without food; another at Bern lived eighteen years on the air alone, anno 1604. Other examples I could alledge out of Ciresius Physician of Padua, Lentulus of Bern, Joubertus, and others; but these may suffice to let us see, that nutrition doth not consist meerly in meat and drink. I will not here alledge examples of miraculous fasts, or of Diabolical and Magical; but such as are meerly natural, as these which I have named: for in them the natural heat was weak, and not able to master the humidity with which they abounded: So then, where there is a weak heat, and much sweet phlegm, which is imperfect blood, as Physicians call it, there the life may be prolonged without food.

I have read (*Mendoza in Flor. phil.*) of a Venetian who fasted forty six years, being of a cold constitution, and abounding with thick phlegme; we see this in the hearb *Semper-vivum*, which many years together liveth, and is green without earth or water, having much natural humidity within it. So the Camelion is onely fed by air, as is said, which appears to be true (however Dr. Brown (*Book 3. c. 21.*) writes to the contrary) by these reasons, 1. The testimonies both of ancient and modern Writers, except a few, and the witnesses of some



Some yet living, who have kept Cameliions a long time, and never saw them feed but on air. 2. To what end hath Nature given it such large Lungs beyond its proportion? Sure not for refrigeration; lesse Lungs would serve for this use, seeing their heat is weak; it must be then for nutrition. 3. There is so little blood in it, that we may easily see it doth not feed on solid meat.

The Doctor saith, *That Frogs and divers Fishes have little blood, and yet their nutriment is solid.* But he doth not prove the nutriment to be solid. Besides, they have more blood then is in the Camelion. 4. To what end should it continually gape more then other animals, but that it stands more in need of air then they, to wit, for nutrition as well as refrigeration. The Doctor imputeth this gaping to the largenesse of his Lungs: This is but a shift; for other animals whose Lungs doe exceed both the Lungs and whole bodies of many Cameliions, do not gape as this doth, and yet they stand more in need of refrigeration, as having more blood and heat, then ten thousand Cameliions. 5. He that kept the Camelion which I saw, never perceived it to void excrements backwards; an argument it had no solid food: and what wonder is it for the Camelion to live on air, when Hay a beast of *Brasil*, as big as a Dog, was never seen to feed on any thing else, as *Lerius* witnesseth? The Doctor concludes, *That the Camelion is abstinent a long time, but not still, because divers other animals are so.* He may as well infer, that the Camelion is cornuted, because divers other animals are so. Each species hath its property, which is not communicable to other species; otherwise it were no property.

*I I.* That water is the aliment of divers creatures, is plain; 1. By the vegetables; for hearbs, trees, and plants are nourished by it. 2. By animals; for it is the food of many fishes, as was shewed by that fish which *Rondeletius* his wife kept three years in a glasse. Grasshoppers feed upon dew, which is water.

I have read (*Mendoza, Prob. 23.*) of Worms in *Armenia*, which feed only on Snow; and of some birds whose aliment is only water. 3. By men; for *Albertus Magnus* speaks of one who lived seven weeks together only upon water. I know *Aristotle*, (*l. 7. de anim.*) *Galen*, and *Averroes* are against this opinion. But we must understand they speak of the pure element of water, which is not nutritive; not of that which is impure, mixed, or compounded; for such may nourish.

Doctor *Brown* will not have water an aliment, 1. *Because*  
some



some creatures drink not at all. *Answ.* To such, water indeed can be no aliment, and so indeed his argument is good; but to say, that water is no creatures aliment, because some creatures do not drink at all, is as much as if he should infer, that no man eats bread, because some men never ate any. 2. He saith, That water serves for refrigeration and dilution; therefore it is no aliment. *Answ.* Why may not the same thing serve both? Doe we not many times eat cooling hearbs, which both refrigerate and feed us. 3. If the ancients (saith he) had thought water nutritive, they would not have commended the Limpid water for the best, but rather turbid streams, where there may be some nutriment. *Answ.* If the Ancients had spoken of Waters fittest to feed Eels, Frogs, and such as live on mud, they would have commended the turbid streams; but they spake of such Waters as are fittest for our bodies, and therefore they commended the Limpid for the best; and yet he confesseth in the purest water there is much terreous residence, and consequently some nutriment.

III. Chilification is an action of the stomach, but not absolutely necessary, because many creatures in the Winter live without it: And this act is not to be ascribed to the heat of the stomach; for though heat as heat doth concoct, yet it doth not chilifie; for neither fiery, nor feverish, nor any other heat of the body can perform this, but that of the stomach; therefore this action must proceed from the specifical form and proper quality of the stomach, which turns all it receives into a white creamy substance, but cannot produce several substances, as the Liver doth; because it is not so hot as the Liver, or rather it hath not that specifical form which the Liver hath. Besides, that the stomachs work is to master the aliment, to concoct it, and to prepare it for the Liver. But besides this quality of the stomach, there is another more strange, when some can eat and digest coals, sand, lime, pitch, ashes, and such like trash. This is called by Physicians a disease, under the name of *Pica, Citta, Malacia*; but I think it proceeds not only from a distemper in the stomach, and malignant acide humors impacted in the membrans thereof; but also, and that chiefly, from some occult quality. *Forestus* (*lib. 18. Obs. 7*) knew one who swallowed down live Eels, another who ate a piece of Lime as big as his fist, and all without hurt. *Fonseca* (*Consult. part. 1. conf. 94.*) knew a woman who daily did eat earthen ware or pot-sheards so long as she lived; and she lived till she was old; even when she fell sick of a fever, she could not abstain



flain from eating of this stuffe: therefore I do not much wonder that the Ostridge can eat and digest iron, which it doth not by its heat, as *Cardan* thinks; (though I deny not but the great heat of that bird, and the thicknesse of his Gizzard may be some help) but rather by an occult quality, or the nature of its whole essence, as *Fernelius* writes: For the truth of this, we have not only the testimonies of the Ancients, but the experiments also of late Writers: For *Langius* in his *Epistles*, writes that he saw some of those Ostriches in the Duke of *Ferrara's* Garden, who swallowed and digested pieces of gold, and other metal. *Leo Africanus* saith, that they swallow whatsoever they finde, even iron. And what wonder is it if the Ostrich eat Iron, when Rats do the same. But Doctor *Brown* denies this for these reasons, (book 3. c. 22.) Because *Aristotle* and *Oppian* are silent in this singularity. 2. *Pliny* speaketh of its wonderful digestion. 3. *Ælian* mentions not Iron. 4. *Leo Africanus* speaks diminutively. 5. *Fernelius* extenuates it, and *Riolanus* denies it. 6. *Albertus Magnus* refutes it. 7. *Aldrovandus* saw an Ostrich swallow Iron, which excluded it again undigested. *Answ. Aristotles*, *Oppians*, and *Ælians* silence, are of no force; for arguments taken from a negative authority, were never held of any validity. Many things are omitted by them, which yet are true; It is sufficient that we have eye-witnesses to confirm this truth. As for *Pliny*, he saith plainly, that it concocteth whatsoever it eateth. Now the Doctor acknowledgeth it eats Iron: *Ergo*, according to *Pliny*, it concocts Iron. *Africanus* tells us, that it devours Iron. And *Fernelius* is so far from extenuating the matter, that he plainly affirms it, and shews, that this concoction is performed by the nature of its whole essence. As for *Riolanus*, his denial without ground, we regard not. *Albertus Magnus* speaks not of iron, but of stones which it swallows, and excludes again without nutriment. As for *Aldrovandus*, I deny not but he might see one Ostrich which excluded his iron undigested; but one Swallow makes no Summer. All individuals have not the same temperament: Among men, some will digest that which others cannot: there might be some weaknesse or distemper in the stomach of that Ostrich. Again, digestion or concoction (if we speak of the first which is the work of the stomach) is nothing else but the altering of the aliment, not into a new substance, (for that is done by the Liver) but into a new quality, in which the natural heat separates the excrements from that which is fit for nutrition: If so, the



then the Iron which this Ostrich excluded, was digested; for the stomach sucked something out of it, and altered that which was fit for nutriment, sending away the superfluous part: Thus the Iron was not undigested, because egested: For of every thing we eat, there is some part excluded. Now the Doctor cannot deny, but that the Iron receiveth an alteration in the stomach; and what I pray is this but chilification? Yet hee will not have this alteration to proceed from the power of natural heat; but from an acide and vitriolous humidity (if there were such a manifest quality, or a vitriolous humidity to corrode the Iron, it would doubtlesse corrode the stomach it self; therefore the safest way is to acknowledge an occult quality.

Again, if the Doctor will speak Philosophically, the principal agent in digestion is heat, not moisture; for humidity compared to calidity, is a passive quality; so then the vitrioll corrodes by its heat, not by its moisture.

IV. When I fell upon this piece, I thought not to meddle with Doctor Browns Enquiries: but finding some of his Assertions contradictory to what I was to write, I thought good to bring some of them to the Test, and to remove all rubbish out of my way; wherein I hope I shall doe him no wrong, seeing as he saith in his Epistle, *Opinions are free, and open it is for any to think or declare the contrary.* Having therefore examined some of his Assertions, I will be bold to enquire into some more of his Enquiries, having no intent to traduce or extenuate his excellent pains, but to elucidate what may seem to be obscure, and to deliver my opinion wherein I think he is mistaken. Whereas then he saith out of Aristotle, *That Flies, Bees, &c. make a sound by the allision of an inward spirit, upon a little membrane of the body.* I will not deny but this may be in some, but not in all: for I have observed the contrary in Gnats, whose sound is made by their wings only; when I pluckt off one wing, they sounded with the other; but when they lost both, they made no sound at all. Again, when he saith, *That the light of the Glow-worm depends upon a living spirit,* he expresseth but a remote cause: for the proximate and immediat cause is the natural heat in a clear luminous water or humour: For I have observed in those I kept some days in grasse, that as this heat decreased, the humour thickened, and as it were congealed, & so the light grew dimmer; being quite dead, there remained the congealed humour, white like a piece of chalk. Those I took were for three or four

nights



nights, so shining, that holding the book neer, I could see to read by them. Again he saith, That grains whose ends are cut off, will suddenly sprout; which thwarts their opinion, who say, that the Pismires bite off the end of the corn, which they store up to prevent the growth thereof. Both these Assertions may be true: For corn cut at the ends, may grow, and yet that may faile which the Pismire bites; because of some malignant quality contrary to the grain, impressed upon it by the Pismires bite, which is not in the knife. Again, he saith, (Book 3. c. 27.) That the plant animal, or vegetable Lamb of Tartaria, is not much to be wondred at, if it be no more then the shape of a lamb in the flower or seed. Sure it must be more then this, if those that write the story thereof deceive us not. For Scaliger (Exerc. 182. 29.) describes it out of them to be like a Lamb in all the parts of it: in stead of horns, it hath long hairs like horns, it is covered with a thin skin, it bleeds when it is wounded, and lives so long as it hath grasse to feed on; when that is spent, it dieth. And they write also, that it is a prey to Wolves. All these circumstances may be true: For 1. the shape, why may not this plant resemble a Lamb, as well as that Indian fruit described by Nic. Monardes, resembles a Dragon so artificially painted by nature, as if it were done by a painter. 2. Why may it not have a Downy, or Woolly skin, as well as Peaches, Quinces, Chesnuts, and other fruits which are covered with a Down, called Lanugo by the Poet? 3. Why may it not bleed as well as that Tree we mentioned but now, called Draco, from the shape of the Dragon which its fruit hath; the juice of this Tree from the resemblance is called the blood of the Dragon, well known in Physick for its astringent and corroborating quality. 4. Why may it not have some animal motions, as well as that plant called Pudica, which contracts its leaves when you touch or come neer it, and dilates them again when you depart? Or that Tree in the Isle of Cimbubon, whose leaves falling on the ground, crawl up and down like Worms: they have (saith Scaliger, Exerc. 112.) two little feet on each side: if they be touched, they run away. One of these leaves was kept alive eight days in a platter, which still moved it selfe when it was touched.

V. That Tigers are swift creatures, is affirmed by all the Ancients; but denied by Bontius, Because (as the Doctor cites him) those in Java are slow and tardigradous. By the same reason he may infer, that our sheep are as big as Asses, and doe carry burthens, because the sheep of America are such; or that the



the African Lions are not fierce, big, and red, as they are described; because the American are not so; for the Indian animals differ much from ours, although they be the same species. Though then the Indian Tygers be slow, the African or European may be swift. Again, the Doctor doubts, that the story of the Remora may be unreasonably amplified. The story is, that it stays ships under sail: This, saith Scaliger, is as possible as for the Loadstone to draw Iron: for neither the resting of the one, nor moving of the other, proceeds from an apparent, but from an occult vertue: for as in the one there is an hid principle of motion, so there is in the other a secret principle of quiescence.

## CHAP. IX.

1. Lions afraid of Cocks: Antipathies cause fear and horror in divers animals.
2. Spiders kill Toads; the diversities of Spiders.
3. The Cocks Egge and Basilisk: Divers sorts of Basilisks.
4. Amphibena proved, and the contrary objections answered.
5. The Vipers generation by the death of the mother proved, and objections to the contrary refuted.

THAT the Lion is afraid of the Cock, is doubted by the Doctor, (book 3. c. 24.) because Camerarius speaks of one lion that leapt down into a yard where were Cocks and Hens, which he ate up. But the same Camerarius (Medit. part. 1. c. 12.) in the same alledged place, sheweth, that this fear of the Lion is justified both by experience, and many eye-witnesses. And surely this is no more improbable then for a Lion to be afraid at the sight of a fire, or for an Elephant to be afraid at the sight of a Hog; which the Romans knew, when they drove an Herd of Swine among the Enemies Elephants, by which means they got the Victory of Pyrrhus. So much afraid is the Elephant of an Hog, that if he hear him gruntle, he will run away. And who would think that a Monky should be afraid and shake at the sight of a Snail, that Erasmus (in amicitia) tels us, he saw one which at the sight of a Snail was so affrighted, that he fell to vomiting so, as the owner could scarce keep him alive. Who can give a reason, why the scratching upon brasle, or other hard metals, should distemper the teeth; and in



in some men force urine? Why are some men whom I know, affrighted at the sight of a Toad; nay, of a Frog? There is among Horses in the same stable, among oxen in the same stall, among children in the same school, an antipathy: It is no wonder then, that so magnanimous a creature as the Lion should be afraid at the sight of a Cock, when the courageous horse startles at the sight of a block; and the Elephant will not touch the straw which the mouse hath touched. Now for that Lion which killed the Cock and his Hens, I deny not but it may be true; yet hence we cannot conclude that the Lion is not afraid of the Cock: For a speciall antipathy may by accident faile in some individuals. A particular exception must not overthrow an universall Rule or Maxime. Sheep are generally afraid of Dogs, yet I have seen a Sheep beat a Dog. Men generally hate Serpents, yet some will keep them in their bosomes; yea, eat them: And it may be that this Lion was mad, and so the phantastie distempered: for they are subject to be mad because of their heat; or else he was a hungred, and hunger we know makes even men transgresse the common lawes of Nature, and eat those things which otherwise they hate.

II. That Spiders will kill Toads, is recorded in Story; yet the Doctor (3. Book c. 26.) in his Glasse found that the Toad swallowed down the Spiders which he included. This may be true, and the other untrue: For all Spiders are not venomous; and those that are, have their degrees of venome, and so wee may say of Toads. That Spiders have a more active poyson then the Toad, is confessed by those who write of these insects: For I read both in Ancient and Modern Writers, that Spiders have poysoned Toads with their touch; but never that any Toad poysoned a Spider: for the Doctors Toad did not poyson but swallow the Spiders, being impatient of hunger, which it cannot endure so long as the Spider; some whereof I have kept nine moneths without food in a glasse, and then they were as nimble at the end of this time, as when I put them first in. Now that some of our Spiders are venomous, I have observed; for by chance one of my acquaintance bruised a Spider which had lighted on his face when he was in his bed, and presently the place blistred and grew scabbed. I have likewise found, that the small bodied Spiders with long legs (which as I think some call Spinners) are more venomous then the big ones: for I inclosed in a glasse some great black bodied Spiders with short legs, with some of those small bodied long shanks, which fell upon the big bodied Spiders and killed them. Such is the



venome of some spiders that they will crack a *Venice* glass, as I have seen; and *Scaliger* doth witness the same, however the Doctor denies it.

III. That the Basilisk should proceed from a cock's egg, is a conceit as monstrous as the brood it self, saith the Doctor; and yet presently after he grants, there may ensue some imperfect or monstrous production. That cocks growing old and decrepid, lay eggs, or something like eggs, on which they sit, as hens do on theirs, is not to be denied: for many will witness this; among the rest, *Lev. Lemnius* tells us (*de mirac. l. 5. c. 12.*) of two old cocks, which in the City of *Ciricæa*, could be scarce driven away from incubation on their eggs, till they were beaten off by staves: And because the Townesmen had conceived a perswasion that of this egg the Basilisk might proceed, they caused the cocks to be strangled, and the eggs to be bruised. It is granted then that cocks lay eggs, or some seminall matter which they exclude and sit upon. 2. That of these eggs ensue strange productions. 3. This may be without a commixture of the seed of both sexes, (though the Doctor denieth it) for we see what strange shapes of Insects are produced of putrefaction even in mans body without any seed. 4. It is granted also that there have been and are Basilisks, though the descriptions of them do in some circumstances differ: For there may be divers sorts of them; those which *Lemnius* describes, seen sometimes in *Germany*, have acuminated heads, and somewhat yellow, three palmes long, having a belly with white spots, a blew back, a crooked tail, and a wide gaping mouth. This description differs but little from that of *Albertus Magnus* (*de anim. 25.*) *Scaliger* speaks of one that was seen in *Rome*; and *Lemnius* tells us that *Germany* is not free from them; but that they are not so venomous as those of *Africa*. Now whether this Serpent is begot of the cocks egg, is the question; we have tradition and witnesses for it, besides probability: for why may not this serpent be ingendred of a cocks putrified seminall materials, being animated by his heat and incubation, as well as other kinds of Serpents are bred of putrified matter.

IV. The Doctors reasons against the two-headed *Amphisbæna*, are not satisfactory. 1. (saith he) The principal parts, the Liver, Heart, and especially the brain, regularly they are but one in any kinde whatsoever. Answ. This is not so: For God to shew his wisdom and greatness, hath made variety of shapes among the creatures; some fishes and Insects have no heads at all, some but one, the *Amphisbæna* two, as *Nicander*, *Galen*, *Ælian*, *Pliny*,



Pliny, and others witness. I have read of birds in *Papilagonia* with two hearts, of the Serpent *Chersydros* that hath two tongues; of a worm in *Taprobona* with four heads. I say nothing of the *Hydra*, because doubtfull: why then may not the *Amphisbana* have two heads? 2. He saith, That it was ill contrived to place one head at both extreames; for it will follow that there is no posterior or lower part in this animal. Answ. This will not follow: for though the head be at both extreames, yet they do not both at the same time perform the office of the head; but when the one moveth, the other suffers it self to be moved, and is in stead of the tail; so that head which moveth Eastward, draweth the other after it; the former then is anterior, the other posterior; and this when it moves Westward, draws the other: and so what before was posterior, becomes now anterior. This was so ordained by nature for the more conveniency of this creature, which cannot turn it self about so nimbly as other serpents do. And of this minde is *Ælian* (de anim.) 3. He saith, That if this animal have two heads, it is not to be called one, but two, because Aristotle saith, that animal is not one but two, which hath two hearts: and therefore geminous births are christned with two names, as having distinct souls. Answ. There may be some reason why two hearts should give demonstration to two animals: because the heart is the originall of life, and all vital actions, which need but one fountain and original: but the reason is not alike in the *Amphisbana's* two heads: for though it hath but one life, and consequently but one heart, yet it hath two severall motions backward and forward: and therefore needed two principles or prime movers by reason it cannot turn so readily it self about as other animals, which though they have but one head, yet have divers instruments of motion subservient to that head, which are defective in the *Amphisbana*: and yet the head is not the originall of all motions in our own bodies: for the hearts motion of *Systole* and *Diastole* depends not upon it. Besides, the Doctor denies not but there are bicipitous serpents, and yet are not called two from their two heads: why then should the *Amphisbana* be denied this priviledge? But he saith, these other are monstrous productions, and besides the intention of Nature. He saith, but he proves it not: I acknowledge no monsters in Insects, especially in such as are begot of the Suns heat and purrification: nor is there any shape in them besides the intention of Nature. For if by nature he means the matter, it is not besides its intention to receive any form: if he understand the Suns influence, or formative power, or



God himselfe, it is not against their intention to produce all kind of shapes for the ornament of the world. But if these bipitrous productions were against their intentions, yet this will not serve his turn, because such a production is but one, although it hath two heads. Lastly, geminous births receive two names in Baptisme, not because they have two heads, but because they have two distinct souls, and individuall properties flowing thence; so that they are indeed two individuals, though their body be but one from the Navell downward, as that Monster was of which *Buchanan* speaks. Now the *Amphisbena* having but one sensitive soule, cannot be called two notwithstanding its two heads. 4. *Many animals (saith he) with one head perform contrary motions.* *Answ.* It will not follow that therefore the *Amphisbena* hath but one head, or that these one-headed animals can as easily perform contrary motions with one head, as that which hath two. Neither are these contrary motions performed immediatly by one head, but by inferior organs which are not in this animall. Besides, I observe that in many worms there is as much life and activity in the taile as in the head; and therefore may be said to have two heads effectively, if not formally. For in Damask-Rose leaves which I kept by me, not being thoroughly dried, worms were procreated, whose heads when I cut off, their bodies were moved by their tails, as if those had been other heads.

V. Concerning the Viper, which all Antiquity affirms, produceth her young ones to her own destruction; we finde some Neotericks doubt, nay deny this truth. Doctor Brown reasoneth against this production., 1. *It's injurious to Nature's providence to ordain a way of production which should destroy the producer.* *Answ.* Nature's providence is no more injured in the corruption then in the generation of the Creatures: seeing the corruption of one is the generation of another; and not onely in Vipers, but in Silk-worms also, and divers other creatures, in production the producer is destroyed. And this also we may observe in men and women oftentimes: Nature is wiser in her productions then we are in our conceits and imaginations. 2. *It overthrowes (saith he) Gods benediction, Be fruitfull and multiply.* *Answ.* Gods benediction of multiplication was not pronounced to the beasts and creeping things, but the birds and fishes. 2. It's a question whether Vipers and some other poysonous creatures were created before the fall. 3. The viper multiplieth fast enough when at one birth she bringeth forth twenty young ones, as *Aristotle* and others affirm; there is then no

cause



cause to complain, when twenty are produced by the losse of one; neither is it a greater curse in the Viper to die, then in all other living creatures; for all are mortall in their individuals, though immortal in their species. 4. If the viper had been created before the Fall, yet this punishment was not inflicted on her till after: for all creatures doe fare the worse by reason of Adams sin, *who hath made them all subject to vanity, Rom. 8. 3. To bring forth in sorrow (saith he) is proper to the woman, therefore not to be translated on the Viper.* *Ans.* I deny that painfull births are proper to the woman: for all animals have some pain more or lesse in their productions. I have seen a Hen, which with the pain of excluding her Egge, fell down gasping for breath, as if the pangs of death had bin on her, and so she continued till the Egge was excluded. Many Bitches and other females have died with pain at the time of their littering. Painfull productions then is a punishment of the woman, and yet no translation to the Viper; for her pain is not thereby eased, because the Viper in such a case is killed: nor are all women alike tortured, some are lesse pained then many other creatures. 4. *This overthrowes (saith he) Natures parentall provision: for the Dam being destroyed, the younglings are left to their own protection.* *Ans.* No, they are left to the protection of him who is by David called the Saviour both of man and beast: and by the same is said to feed the young Ravens when they call upon him. And God in Job, long before David, sheweth, That he fills the appetite of the young Lions, and provideth food for the young Ravens when they cry unto God. For the Naturalists tell us, the old Ravens quite forsake their young ones; but God feeds them with Flies and Wormes he sends into their nests. The like improvidence and cruelty we find in Ostridges, who exclude their Eggs in the sand, and so leave them without further care, to his providence, in whom all things live, and move, and have their being: Therefore God complains in Job, (Chap. 39. 14, 15, 16.) of the Ostridges astorgie and cruelty, in leaving her Eggs in the earth, forgetting that the foot may crush them, or that the wild beast may break them: shee is hardned (saith he) against her young ones, as though they were none of hers. The Cuckow also wanteth parentall provision: for she layeth her Egge in another birds nest, and so leaves it to the mercy of a stranger. And no lesse cruelty is there in this young nursling, then in the viper: for he both destroyeth his Foster-brothers, and the mother that brought forth and fed him. I read also in *Ælian* of Scorpions begot sometimes in Crocodiles Egges, which sting to death the



Dam that gave them life. The young Scorpions doe use to devour the old. I have also read of women who have brought forth monsters to the destruction both of the mother and of the child in her womb: therefore what the Ancients have written of the vipers cruelty, is not a matter so incredible as the Doctor makes it. As for the experiments of some Neotericks who have observed the young vipers excluded without hurt to the parent; I answer, 1. There is great odds between the Vipers of *Africk* or other hot Countries, and those in cold Climates; and so there is in poysonable herbs and Serpents, which lose their venome upon transplantation: in cold Countries the most fierce, cruell, and poysonable animals lose these hurtfull qualities. 2. The works of Nature in sublunary things, are not universally the same; but, as the Philosopher saith, *ὡς ἐπὶ τὸ πολὺ*, for the most part there is no Rule so generall, but hath some exceptions; ordinarily the child comes out with the head forward, yet sometimes otherwise; ordinarily the child is born at the end of the ninth moneth, yet sometimes sooner, sometimes later: Therefore though ordinarily the young Vipers burst the belly of the Dam, yet sometimes they may be excluded without that rupture. 3. Education and food doe much alter the nature of creatures; these vipers mentioned by *Scaliger* and others, which excluded their young ones, or viperels by the passage of generation, were kept in bran within boxes, or glasses, and fed with milk, bran, and cheese, which is not the food of these wild vipers in hot Countries. It is no wonder then if the younglings staid out their time in the womb, being well fed, and tamed by the coldness of the climat. 4. All the Ancients doe not write that the vipers burst the belly, but only the membrans and matrix of the Dam, which oftentimes causes the losse of her life; and they wanted not reason, besides experience, for this assertion, to wit, the fierceness of their nature, the heat of the countrey, and the numerousness of their young ones, being twenty at a time; besides the goodness of God, who by this means doth not suffer so dangerous a creature to multiply too fast; for which cause also he pinches them so in the Winter, that they lie hid and benumbed within the earth; besides, he will let us see his justice, in suffering the murder of the Sire to be revenged by his young ones upon the Dam. As for the Doctors exception against *Nicanders* word *ἀποκόψειν*, it is not material; for it is a Poetical expression, and what is it to the purpose, whether the head be bit, or cut off, if so be the bite be mortall?



CHAP. X.

1. Moles see not, and the contrary objections answered.
2. The opinions of the Ancients concerning divers animals maintained.
3. The right and left side defended.
4. The true cause of the erection of mans body, and the benefit we have thereby.
5. Mice and other vermin bred of putrefaction, even in mens bodies.
6. How men swim naturally; the Indian swimmers.

Concerning Moles, the Doctor proves they are not blind, (*Book 3. cap. 8.*) because they have eyes: for we must not assigne the Organ and deny the Office. *Ans.* Scaliger tells us they have not eyes, but the form of eyes. *Pliny (lib. 11. cap. 37.)* saith, They have the effigies of eyes under the membrane, but no sight, being condemned to perpetuall darknesse. *Aristotle (lib. 3. de Animal.)* saith, *οὐκ ὁρᾷ*, it seems they have eyes under a thin skin, and a place for eyes. The Prince of Poers calls them, *Oculis captos*, (*Geor. 1.*) Scaliger (*Exer. 243.*) saith, They are deprived of the noblest sense, and gives the reason, because living still under ground, they had no use of sight. If then by eyes are meant the perfect organs of sight, with all things requisite thereto, I deny they have eyes, and consequently sight: they have neither the organ nor the office, except we say, that like is the same. Now these forms of eyes Nature gave to the Moles rather for ornament then use; so wings are given to the Ostrich, which never flies; and so a long tail to the Rat, which serves for no other use but to be caught sometimes by it. And to what end hath Nature given teats to men, and other males? Again, Nature in all her works aims at perfection; but is oftentimes hindred by some obstacle, which is the reason why the Mole wants eyes, and the *Manucodiata* feet: but what is defective in the Moles eye, is recompensed by the quickness of his hearing. 2. He saith, That they are not exactly blind; for they can discern the light, which is one object of vision. *Ans.* I do not believe they can discern the light at all. 2. If they could discern the light, yet they are blind: for I have known men stark blind, who yet have discerned light from darknesse when a candle came into the room. 3. Light is not the object of vision; for we see not light, but lucid and coloured; we see not light, but by it: Light is *Objectum quo, non quod*. 3. He saith, A Mole cannot be properly blind, if it want the organs or capacity of seeing: for privations presuppose habits.



*Answ.* A Moal is as properly blind as he in the ninth of *John*, who was born so; for he had no capacity of seeing naturally, no more then the Moal; yet he is said to be blind from his nativity, and that properly, because he was a subject capable of sight, *quatenus* an animall or sensitive creature, which is capable of sight, because of senses, whereof the sight is one. Moals therefore are capable of sight, in the genius of *animals*, though not in the *species* as a Moal, and so an Oyster is capable of sight.

2. The Doctor prying too narrowly into the sayings of the Ancients, reckoneth them amongst his *Vulgar Errors*, which being rightly understood, are no errors at all; as when they say the Elephant hath no joynts, they meant their joynts were stiffe, and not so easily flexible as those of other animals. When they write that the Swan sings, they meant that with their wings they made a kind of harmonious noyse, as the learned Poet expresseth in that Verse:

*Cantantes sublimē ferunt ad sidera Cygni;*

Which he explains in another place,

*Ut reduces ludunt illi stridentibus alis.*

When they say the Lampery hath nine eyes, they mean so many spots resembling eyes. When they write, that a Horse and Dove have no gall, they mean, that these have not baggs of gall annexed to the Liver, as other animals. When they speak of Griffins, that they were animals like Eagles in their foreparts, and behind like Lions; they spake mystically, shewing by this hieroglyphick, the valour, magnanimity, courage, and audacity that ought to be in Princes and Governours. And when they write, that Toads doe pisse, they did not speak properly, but onely meant, that they squirted out some liquid matter behind. When they spoke of the Toads stone, they do not mean a true and proper stone, but a concretion or induration of their crany. When they write that Hares are double Sexes, they write no more then what hath been observed in other animals which are Hermaphroditicall, and in whom sometimes females have been changed into males. Hares also make a shew of a double Sex, because of the two Tumors representing Testicles, and their holes or cavities near the siege in the males, by which they seem also to be females. And what they write of their superfatation, is true: for the like is incident to some other animals, even to women. When they say that Snails have eyes at the



the ends of their horns, their meaning is, that these are like eyes. So when they hold, that all animals of the land, are in their kind in the sea, they mean that there was a great resemblance between the sea and land-animals. So when they write, that the Peacock is ashamed when he looks on his black feet, they write symbolically, intimating that pride ends in shame, when men look upon their deformities and infirmities. When they say, whelps are blind nine dayes, they mean that they are so for the most part, though some be blind three or foure dayes longer. When they write that Worms have no blood, they write properly; for how can those have blood which have no liver, or other sanguifying organs? that red humour in them is not blood properly, but analogically.

II. That there is in man a right and a left side, is manifest by Scripture, generall consent, Experince and Reason, which also prove the dignity, agility, and strength of the right side above the left; because on the right side is the Liver, the cistern of blood, in which consisteth our life, vigor & strength, therefore this side is not so often as the left subject to palties, because it is stronger to resist and repell the matter of that disease into the weaker side. Yet Doctor Brown (*Book 4.c.5.*) denies any prepotency in the right side, and such as ariseth from the constant root of Nature, because he finds not Horses, Bulls, and Mules, are generally stronger on this side. *Ans.* There is great diversity between the conformity, situation, and parts of mans body and beasts, and therefore to reason from the one to the other, is absurd: We find not that variety of colours in the eyes of Horses, Bulls, and Mules, that are in Mans eyes; nor doe we find the Horses gall annexed to his liver; shall we hence inferre a deficiency of things in man? The weight of the Bodies of Four-footed Beasts, lieth equally upon all foure, and all foure equally are used in motion; and therefore there was no reason why any side or legge should be more prepotent then another; but it is otherwise in man, to whom Nature hath given one side stronger and nimbler then another for uniformity of action. Hence the right hand and foot are stronger then the left. Neither is it Custome but Nature that hath given this dexterity to the right side: For I have known some who have endeavoured by custome to bring their left hand to perform the offices of the right, but could never doe it with that ease and dexterity. *Scaliger* and *Cardan* speak of one who had never a hand, yet with his right foot could perform all the offices of the right hand, write, sew, eat, drink, & sling darts. 2. He saith,

that



that children indifferently use either hand. *Answ.* That is because as yet in the tender infant the heat and strength of the body is equally diffused, and not settled in one part more then in another; but as he begins to gather strength, and the body to be more solid, so doth the right hand begin to be more agill; though I deny not but in some the left hand is more agill, but these are few, and aberrations from the common course of Nature: for we see that in all her works there are some accidental deviations. His other objections are coincident with these two, and his discourse of the right and left side of heaven, is impertinent to this purpose: therefore I will spend no time in refelling it: for some make the East, some the South the right part of heaven; but I will conclude with *Aristotle*, (*hist. animal. l. c. 15*) the right side and left in man consist of the same parts; but the left side is every where weaker.

IV. The end why mans body was made erected, was to look up toward heaven, whence the soul hath its originall, where our hopes should be, and our happiness shall be; by the contemplation of which, we are brought to the knowledge of Gods goodness and wisdom: For the heavens declare the glory of God, and the firmament his handy work, *Psal. 19*. Yet the Doctor (*book 4. c. 1.*) will not have this the end of mans erection, but out of *Galen* the exercise of Arts, which could not be performed in any other figure. Again (saith he) the eyes of divers fishes regard the heavens; birds who have no upper eye-lid, have in this the advantage of man: So the position of the frog with his eyes above the water, serves to behold a great part of the heavens. *Answ.* All these are weak Assertions; for the God of Nature created man to enjoy happiness, and to glorifie him; this is the chief end of his creation. Now this happiness is heaven, by beholding which, our knowledge of God is confirmed, our hopes established, and our joy and affections to heavenly things are enlarged: The invention of Arts then was but a secondary end, which it seems *Galen*, that meer naturall man, thought to be the chief end. And whereas the Doctor saith, (that by *sursum aspicere*, was not meant to look upward with the eye, but to have his thoughts sublime;) I would know what means so forcible to sublimate the thoughts as the eye? All knowledge and affection of and to the object, comes by the senses. How should *Abraham* have known the glory and multitude of his posterity, had he not looked up (as God commanded him) to the stars? The wise men found Christ in *Bethlehem* by looking upward to heaven, where they saw his star. Christ in blessing the bread, and in praying



praying, looked up towards heaven: should not our eyes be fixed there where our treasure is? Our Saviour went up to heaven, and we expect him again to return with the clouds of heaven. Our eyes then should be directed thither as well as our thoughts. The Philosophers by the knowledge of the first *Mobile*, came to the knowledge of the first mover. And though birds, some fishes and frogs, may have an advantage in looking upward, yet this advantage was not given them to look on heaven, of which they have neither knowledge, hope, affection or interest: they look upward then not to contemplate heaven, but to watch either flies to feed on, or kites, hawkes, and other ravenous fowle to avoid them.

V. He doubts whether mice can be procreated of putrifaction. So he may doubt whether in cheese and timber worms are generated; Or if Betels and wasps in coves dung; Or if butterflies, locusts, grasshoppers, shell-fish, snails, eels, and such like, be procreated of putrified matter, which is apt to receive the form of that creature to which it is by the formative power disposed. To question this, is to question Reason, Sense, and Experience: If he doubts of this, let him go to *Ægypt*, and there he will finde the fields swarming with mice begot of the mud of *Nylus*, to the great calamity of the Inhabitants. What will he say to those rats and mice, or little beasts resembling mice, found generated in the belly of a woman dissected after her death, of which *Lemnius* is a witness, who thinks this generation might proceed of some sordid excrement or seminal pollution of those animals with which the womans meat or drink had been infected. I have seen one whose belly by drinking of puddle water, was swelled to a vast capacity, being full of small toads, frogs, eets, and such vermin usually bred in putrified water. A toad hath been found in a found piece of Timber.

VI. That men swim naturally he cannot assent to, because other animals swim as they go; but man alters his natural posture as he swims, (4. Book c. 6.) *Ansr.* This is no reason; for man alters his natural posture when he crawls; will it follow therefore, that this motion is not natural to man. But to speak properly, swimming is no natural motion, neither in man nor beast: For if we take natural as it is opposite to animal, swimming is an animal motion; and if we take natural as it is opposite to artificial, then swimming is an artificial motion; for there is some Art in it. But if we take nature for a propensity, facility, inclination, or disposition; then, I say, these are as well in men



men as in beasts. Therefore Pliny tells us of the *Troglodites*, that they swim like Fishes. *Lerius*, *Acosta*, and other *Indian* Historians write, that the *American* children begin to swim as soon as they begin to walk; and that for eight dayes together they can live in the Sea, and longer if it were not for feare of the great Fishes: so swift and skillfull they are in swimming, that they out-swim the Fishes and catch them; and so farre they exceed other animals in this motion, that they can swim with the left hand onely, holding hooks and darts in the right, which no other creature can doe. If it be objected, That swimming is not naturall to man, because he learns it; I answer, That walking and talking are naturall actions to man, and yet he learns both when he is a child. So I have seen old birds teach their young ones to flye. Lastly, if it be naturall for beasts to swim because of their posture, then it must needs be as naturall to those wilde men, who from their infancy were brought up among wild beasts, to walk upon all foure, having no other posture.

## CHAP. XI.

1. *The Pictures of the Pelican, Dolphin, Serpent, Adam and Eve, Christ, Moses, Abraham, and of the Sybils defended.* 2. *The Pictures of Cleopatra, of Alexander, of Hector, of Caesar, with Saddle and Stirrups maintained.*

**T**HE DOCTOR [*Book 5. c. 1.*] quarrels with some pictures, as 1. with that of the Pelican opening her breast with her Bill, and feeding her young ones with her blood. But for this he hath no great reason: for *Franzius* (*de animalib.*) to whom he is beholding for much of his matter, tells him that this and divers other pictures are rather Hieroglyphical and Emblematical, then truly Historicall: for the Pelican was used as an Emblem of paternall affection among the Gentiles; and of Christs love to his Church among the Christians. 2. With that of the Dolphin, because he is painted crooked, whereas his naturall figure is straight. This is true, yet he is crooked sometimes, as when he leaps and jumps, and in this posture the painters expresse him. 3. With the Serpent tempting Eve, because it is painted with a virgins head, which might afford suspition to Eve in beholding a third humanity beside herselfe and Adam. But this could not so much trouble Eve, to speak with one like her selfe, as to hear a reasonable



reasonable discourse proceed from a Serpents mouth; for she could not be so grossly ignorant in that happy state, where there could be no deception of mind, as to think a serpent could speak and discourse rationally; therefore Sathan cunningly assumes a womans face, whereby there might be the lesse suspition. neither could Eve be amazed to see a Serpent with a womans face; for divers other creatures have the form of humane faces, such as Baboons, Apes, Monkies, Satyrs, and that American beast mentioned by Andrew Thevet, called Haijt by the Inhabitants, and Guedon by the French; the picture whereof may be seen in Gesner. 4. He quarrels with the pictures of Adam and Eve with Navels, accounting those parts in them uselesse superfluities; because the use of the Navell is to continue the infant unto the mother, and by the vessels thereof to convey its aliment. The Navell, which is the center of the body, was not uselesse or superfluous in Adam or Eve; because they were ornaments, without which the belly had been deformed: Therefore Solomon amongst other beautifull ornaments of the Church, puts in the Navel for one, *Thy Navel, saith he, is like a round Goblet, Cant. 7. 2.* He might as well quarrell with the picture for giving haire to Adam and Eve; for the sole use of haire both for head and chin, is for ornament and distinction. 5. He questions Christs picture with long hair, seeing he was no Nazarite by vow. I answer, 'Tis true, he was no Nazarite by vow; for he drank Wine, and approached the dead, yet he was a true Nazarite, because he was as the Apostle saith, *separated from sinners*: Therefore it was fit he should in this respect weare long haire, as Sampson the Nazarite and Type of Christ had done before. Besides, haire being an ornament, and signe of ingenuity (for slaves durst not weare long haire;) and being also the custome of those times and Countries, it is most probable he wore long haire; and therefore his picture is causlessly quarreld with; especially seeing he was so painted in that picture sent by Lentulus, President of Judea, to Tiberius. And in the same length of hair he was found in some old brasse coins at Rome, which Theleus Ambrosius did see; in his Introduction to the Chaldee Tongue, he speaks of this. 6. He rejects Abrahams picture sacrificing Isaac, because he is described as a little boy. Answ. Josephus makes Isaac at that time 25 years of age; some Rabbins make him above thirty. But Aben Ezra the Rabbin makes him onely twelve years old: And sure at this age he might be able, by his Fathers help, to carry a bundle of wood up the hill, being men were stronger at that time then now; howbeit he was but a Boy in comparison

of



of his fathers age, who was now 125 years old, if *Isaac* was 25. for he was born in the hundredth yeare of his Fathers life. 7. He reproves the picture of *Moses*, because painted with horns. It was not the Painter but the Scripture which gave him horns. For the Hebrew word *Keren* is so translated by *Aquila* κερῶν, and by *Jerom*, *Cornuta*: So it is in the vulgar Editions of *Sixtus* and *Clemens*. So it is translated by divers Protestants, by *Munster*, by *Rivet*, and some others, and therefore *Munster* doubts whether that relation of *Steuchus* be true, that the Jewes are offended when they see *Moses* painted with horns, seeing *R. Solomon* and *Kimchi* doe use the word *Horn*, saying, That the beams of *Moses* face did resemble horns; and therefore *R. Solomon* calls those Rayes the horns of Magnificence. It is true, there is a difference between *Keren* and *Karon*, that signifying a horn, this to shine, but who could put this distinction truly, before the invention of the Hebrew pricks; neither is it materiall which way it be translated, seeing clear horns do cast rayes of light, and luminous bodies cast abroad their rayes like horns, as we see in the Sun and Moon. Neither is there any danger of conformity with *Jupiter Ammon*, (as the Doctor thinks) if *Moses* be painted with horns: for *Jupiter* was painted and worshipped not with Rams horns alone, but with the Rams head and skin, with which his Image was yearly adorned; because in the shape of a Ram he shewed a Well of water to *Bacchus*, when he was dry in the Desarts of *Libya*; and because he turned himselfe into a Ram when he fled from the Giant into *Aegypt*. And lastly, he shewed himselfe to *Hercules* in the shape of a Ram. As for cornuted *Pan* and *Bacchus*, they were the same with *Jupiter*, one Sun under divers names and shapes, as *Macrobius* shewes. 8. He reproves the pictures of the Sybils, because there be ten or twelve of them, and all with youthfull faces. For the number of ten, he must reprove *Varro* (*de Divinat*) not the Painter, for so many he delivers to us; others have added two more. And that there were so many, *Boisardus* makes it appeare by what he hath collected out of ancient Authors, concerning the difference, originals, times, and numbers of the Sibyls, where he shewes, that *Sibylla Cumæa* whom *Aeneas* consulted, and *Cumana*, who sold the Bookes to *Tarquin*, were different, between whom were six hundred years distance. As for their youthfull faces, he hath more reason to quarrell with the Poets then with the Painters; but indeed neither are to be blamed; For the Sibyls may be aged, and yet look young, as many aged people doe; some I have already mentioned,



mentioned who looked young after they have been an hundred and fifty yeares old. 'Tis true, that *Sibyl* is called *Longeva* by the Poet, (*Æn.* 6. ) but by that was signified her long life, not a withered or wrinkled face. The same word is by the same Poet ascribed to *Æneas*, whom notwithstanding he makes immortal; and *Romulus* in *Ennius* is said, *Dege-re ævum* in heaven; so in *Æschylus* the gods are called *ἄποβέας*, that is, *Longævi*, who I think have not old faces. As in *Charon*, so in the *Sybils*, there was *Cruda viridisque, senectus*. It is true also that *Sibyl* is termed *Anus* in *Livii*. But I deny the Doctors Etymology out of *Festus*; for *anus* is *ab annis*, and not from *α* and *νῆς*, as if she had doted; for she could not be *ἄνῆς*, that was *ΝῖϞ-βελή*: *Sibylla* is so called, as being the mind and counsel of God, therefore could not be a dotard.

II. There are some other pictures which offend the Doctors eyes; as, 1. That of *Cleopatra with two Asps*. *Suetonius* speaks of one, *Florus* of two, so doth *Virgil*,

*Nec dum etiam geminos à tergo respicit angues.*

So doth *Propertius*,

*Brachia spectavi sacris admorsa colubris.*

He should therefore have reprov'd these rather than the Painter; he should also have quarrell'd with *Augustus*, who from the prickles he found in her arms, concluded she was bit by *Asps*, and therefore imployed the *Phylli* to suck out the poyson. But whether she was bit by one, or two, or none, the picture is harmlesse, and consonant both to *Roman Historians* and *Poets*. 2. The pictures of the nine *Worthies* displease him; because *Alexander* is described sitting upon an *Elephant*, *Hector* on *Horseback*, and *Cæsar* with *Saddle and Styrrups*. But he should remember that *Painters* and *Poets* have a priviledge above others,

*Pictoribus atq; Poetis quid libet audendi  
semper fuit æqua potestas.* Horat.

And yet these pictures are partly historicall, partly hieroglyphical. *Alexander* sits on an *Elephant*, to shew his conquest over the *Indians* which most abound in *Elephants*. Besides, this picture hath reference to that story of the *Elephant* in *Philostates*, (*Lib.* 2. *Cap.* 61.) which from *Alexander* to *Tiberius* lived three hundred and fifty yeares:

This



This huge Elephant *Alexander* after he had overcome *Porus*, dedicated to the Sun in these words, Ἀλέξανδρος ὁ Διὸς τὸν Νικητὰ πρὸς ἡλίῳ; for he gave to this Elephant the name of *Ajax*, and the inhabitants so honored this beast, that they beset him round with Garlands and Ribbons; they used also to anoynt him, and adorned him with a golden chain, It was not then without cause he is painted sitting on an Elephant, rather then *Judas Macchabeus*, or any others who have overcome bat-tels wherein were Elephants; or *Cesar*, whose triumph was honored with captive Elephants; for he was not the first, long before him *Curius Dentatus* was thus honored, and so was *Metellus*, who had an hundred and twenty captive Elephants in his triumph. Again, the Doctor asks, *Why Hector is painted upon an horse?* I answer, because he was a brave Cavalier, and kept excellent Horses; such, as if we will believe *Homer*, had understanding: for *Hector* makes an eloquent speech to them, and his wife *Andromache* fed them with good bread and wine, (*Iliad. lib. 8.*) Their names were *Zanthus*, *Podargus*, *Aithon* and *Lampus*: Is it likely that he would keep such horses and never ride them? whereas Horsemanship was in use long before. And we read in *Pindarus*, (in *Olympiad*) that the Grecian Princes took delight in keeping and riding of good Horses. And although the Ancients used to fight in Chariots, yet sometimes they fought on Horseback too, being as *Pliny* saith, taught so to fight by the Theban Centaurs. As for *Casars* Saddle and Stirrops, they are neither dishonour to his picture, nor repugnant to story; for though we find some of the ancient equestrial Statues without Saddle or Stirrops, it will not thence follow these were not in use; for we find the ancient Roman Statues bare-headed; will it therefore follow there were no use of Hel-mets, or that they fought or rid bare-headed? But we doe not find (saith the Doctor out of *Salmuth* upon *Pancerol*) the word *Stapida* in ancient Authors. I answer, We find words e-quivalent; for what is *Suppedaneum*, *Pedamentum*, *Subex*, *Peda-neus*, and *Staticulum*, but the same that *Stapida* which we call Stirrup? So we find *Ephippium* in *Horace* [*Optat Ephippia bos piger*] and *Equorum strata* found out by *Pelethronius* in *Pliny*, and what were these but Saddles? For to take *stratum* there for an Horse-cloth, is ridiculous, as if that had been such a piece of invention to be recorded, to cover the Horse back with a piece of Cloth. *Appian* writes of the Numidians, that they used to ride without Saddles; but nothing of the Romans. The two verses which the Doctor citeth out of *Salmuth* to prove his Assertion,



Assertion, are needlesse; for in the one is left out the principall word, *Saltus superbus emittat in currum*: So that *Turnus* did not leap on Horseback; but into his Chariot, [*Æn.* 12.] The other, *Corpora saltu subiciunt in equos*, shews, that they jumped on Horseback; but whether by stirrups or not, is not there set down.

CHAP. XII.

1. The Picture of *Jephtha* sacrificing his daughter maintained.
2. The Baptists wore a Camels skin.
3. Other pictures, as of *S. Christopher*, *S. George*, &c. defended.
4. The antiquity, distinction and continuance of the Hebrew tongue, of the Samaritans, and their Letters.

**T**He picture of *Jephtha* sacrificing his daughter, is questioned by the Doctor (5 Book c. 14, 15, 16, &c.) because (saith he) she died not a natural but a civil kind of death. *Ans.* Indeed her death was neither natural nor civil, but violent, being sacrificed by her father. This he denieth; because she bewailed her virginity, not her death. *Ans.* She had no reason to bewaile her death, to which she freely offered herself; but to die childlesse deserved lamentation, because that was a curse among the Israelites. 2. Because the women went yearly to talk with *Jephtha's* daughter, which had she been sacrificed they could not have done. *Ans.* The word *Letannoth* from *Tanan*, signifieth to lament, and so it is rendred *Spévev*, by the Seventy; and *Leallaah* by the Chaldee Paraphrast; so it is interpreted by *Munster*, by the old Latin Edition, by the French and English translation. But suppose the word were derived from *Tanah*, to declare or speak, yet this will not prove *Jephtha's* daughter was alive: For in mournfull complaints and lamentations over the dead, words and Elegies were oftentimes expressed, and *Prosopopeia's* are used to them as if they were alive; as we see *Dauids* Lamentation for *Jonathan*, and in other places both of sacred and profane writ. So did that sorrowful mother speak to her dead son *Eurialus*, and *Æneas* to dead *Pallas* in the Poet. 3. Because it is said in the Text, And she knew no man, he inferres, that virginity was her onely death. *Answer.* These words, she knew no man, are added to shew the cause why the women so much lamented her death, in that she died childlesse. 4. The offering (saith he) of mankind, was against the Law of God. *Ans.* True: But will it therefore follow, that *Jephtha* did not sacrifice



his daughter. He may as well infer, that David committed not adultery and murther, because these were against the Law of God. How often are Gods Laws violated by the best of his servants? 5. He thinks *the Priests and people would have hindred this sacrifice; and that Jephtha was no Priest; and that he had evasion for his vow by redeeming his daughter; and that his vow of Sacrifice was to be understood only of that which was sacrificeable and lawfull.* *Answ.* These are but the conjectures of those who would defend *Jephtha*: for it is more likely neither Priest nor people durst oppose his resolution, being now strong and crowned with victory; and though he was no priest, yet it was no unusual thing for Princes and great Commanders sometimes to perform the Priests office; and though he might have evaded his vow, yet it seems he knew not so much, for superstition had blinded him: therefore he saith, *I have opened my mouth to the Lord, and I cannot go back.* And doubtless he thought that the sacrificing of his daughter was lawfull; grounding this his conceit upon Gods command to *Abraham*, and commendation of him for his readiness to sacrifice his son. Lastly, he saith, the 31 verse may be thus rendred, *It shall be the Lords; or I will offer.* *Answ.* Most Translations have it, and *I will offer*; although the Hebrew *Ve*, sometimes signifies *Or*; but this is seldom. Hence then we see, the Painter is not to be blamed, who in representing *Jephtha's* sacrifice, is warranted by the Scripture, by *Austin*, *Ambrose*, and *Hierom*, by the ancient Rabbins, and *Josephus*, besides reasons. For what needed *Jephtha* so to vex himself, and tear his cloathes, if he meant only to sequester his daughter from marriage and humane society? Again, there was neither Law nor President for him to vow his daughters virginity; nor could such a vow be effectually without her consent. It was a curse also in *Israel* to be childless, and it had been ridiculous in him or her, to vow virginity and then to lament it.

II. He excepts against the picture of *John Baptist*, because he is painted in a Camels skin, whereas the text saith his garment was of Camels hair. *Answ.* It was fit the Baptist, who came to preach repentance for sin, should wear a garment of skins, which was the first clothes that *Adam* wore after he had sinned; for his fig-leaves were not proper, and this garment also shewed both his poverty and humility. For as great men wear rich skins, and costly furs, he was contented with a Camels skin. By this garment also he shewes himself to be another *Elijah*, (2. Kings 1.) who did wear such a garment, and to be one of those of whom



whom the Apostle speaks, who went about in skins, of whom the world was not worthy. Neither was it unusefull in *Johns* time, and before, to wear skins; for the prophets among the *Jews*, the Philosophers among the Indians, and generally the Scythians did wear skins; hence by *Claudian* they are called *Pellita juvenus*. Great Commanders also used to wear them; as *Hercules* the Lyons skin, *Acestes* the Bears, *Camilla* the Tigers. *Johns* garment then of Camels hair, was not as some fondly conceit, a Sack-cloth, or Chamblet; but a skin with the hair on it. So in *Exodus* (chap. 25.) the people are commanded among other skins, to bring to the Tabernacle Goats hair: not as if they were to pluck off the hair for *Aaron*, and keep the skins to themselves, but to offer both: therefore in the originall *Hairs* is not expressed, but the word *Goats*.

III. In some subsequent Chapters the Doctor questions the pictures of *S. Christopher* carrying Christ over the river, of *Saint George* on Horse-back killing the Dragon, of *S. Jerom* with a clock hanging by, of Mermaids, Unicorns, and some others; with some Hieroglyphick pictures of the *Ægyptians*. In this he doth *luctari cum larvis*, and with *Æneas* in the Poet,

*Irruit & frustra ferro diverberat umbras.*

He wrestles with shadows: for he may as well question all the Poetical fictions, all the sacred Parables, all tropicall speeches; also Scutehions, or Coats of Armes, signes hanging out at doores, where he will finde blew Boars, white Lions, black Swans, double-headed Eagles, and such like, devised onely for distinction. The like devices are in military Ensignes. *Felix* Prince of *Salernum* had for his device, a Tortoyse with wings flying, with this Motto, *Amor addidit*; intimating, that love gives wings to the slowest spirits. *Lewis* of *Anjou*, King of *Naples*, gave for his device, a hand out of the clouds, holding a pair of scales, with this Motto, *Æqua durant semper*. *Henry* the first of *Portugal*, had a flying Horse for his Device. A thousand such conceits I could alledge, which are symbolical, and therefore it were ridiculous to question them, as if they were historicall. As for the Cherubims, I find four different opinions: 1. Some write they were Angels in the form of birds. 2. *Aben Ezra* thinks the word *Cherub* signifieth any shape or form. 3. *Josephus* will have them to be winged animals; but never seen by any. 4. The most received opinion is, that they had the shape of children: for *Rub* in Hebrew, and *Rabe* in Chaldee, signifieth a child; and *Che*, as: So then, *Cherub* signifieth, as a child, and it's most likely they were painted in this form.



IV. For the Doctors questioning divers superstitious observations, (5. book, c. 22.) as the crossing of a Hare, the falling of salt, the breaking of Eggshells, and such like; I have nothing to say, but to conclude with him, that they are superstitious, yet ancient. But when he asks, *whether the present Hebrew be the unconfounded language of Babel.* I answer, That if by the present *Hebrew* he mean the language which they now speak, it is not: for as the greatest part of the world lost that tongue (except *Hebers* family) at the confusion of Babel, so *Hebers* family) the *Jewes*) lost it themselves in the captivity of Babel; for being mingled with the Chaldeans, they made a mixt language of *Hebrew* and *Chaldee*, which for distinction sake was called *Syriac*; and sometimes *Hebrew*, because the *Jewes*, *Hebers* posterity, spake it. Hence *S. Hierom* is to be understood when he writes, that *Matthew* penned the Gospel in *Hebrew*, and *Eusebius* when he calls it his native language, they mean the *Syriac*, which was now the native language of the *Hebrewes*; and *S. Paul* in the *Acts* is said to have made a speech to the people in *Hebrew*, the meaning is, he spake in *Syriac*; for they understood not the ancient *Hebrew*, onely the Priests and Lawyers kept the knowledge of it. Therefore it had been vain for *Matthew* to write his Gospel, or for *Paul* to speak in pure *Hebrew* to those that understood it not; yet there is an *Hebrew* Gospel of *S. Matthew* extant, which some think was written by *S. Bartholomew* and by *Pantanus*, coetaneal with *Origen* brought from the *Indies*, this imperfect and torn Copie, *Munster* saith he extorted from the *Jewes*. But if his question be whether that *Hebrew* text now extant, be the ancient *Hebrew* tongue before the confusion; I answer It is: For though the *Jewes* lost their ancient language in respect of speaking and use, yet the Bible was carefully retained in the true *Hebrew* without any alteration, save onely in the Characters or Letters, which about the captivity were changed by *Esdras*, as *Hierom* (*de emendat. temp.* p. 621.) *Joseph Scaliger*, *Joh. Drusius Casper Waserus*, lib. 2. of his old *Hebrew* coin, and *Sethus Calvitius* in his Chronological *Isagoge* witnesseth, that this was done by *Esdras* to debar all commerce with the Samaritans, not the Israelites, which were long before carried away by *Salmanasser*; who also were called *samaritans* from their chiefe Citie *Samaria*, but I understand that rable of Nations which *Salmanasser* brought in to possesse the Israelites lands. These with so many of the ancient Samaritans or Israelites as remained in the land, retained the ancient *Hebrew* characters in which the Law was given by *Moses*; and these letters for



for distinctions sake were named Samaritan; and those of *Esdra*s called *Hebrew*, and square from their form. Some ancient coins, as *Sicles*, have been found with Samaritan characters on them, which shew this difference. The form of these letters may be seen in the Samaritan Alphabets. As these Samaritan retained the ancient characters, so they did the ancient Pentateuch of *Moses*, and no more. Now that *Hebers* posterity retained their language without mixture after the Flood, is proved by *Austin* and *Jerome* out of the Hebrew Names given to the creatures before the Flood. It stood also with reason that *Hebers* family should not be partakers of the worlds punishment in this confusion of tongues, seeing they were not guilty of their sins.

CHAP. XIII.

1. *There is not heat in the body of the Sun.* 2. *Islands before the Flood proved.* 3. *The seven Offiaries of Nilus, and its greatness.* The greatness of old Rome divers ways proved. Nilus overflowing, how proper to it: the Crocodiles of Nilus; its inundation regular.

**T**HE Doctor in his subsequent discourses (6. Book c. 1, 2, 3, 4, 5, 6) hath many learned Cosmographicall passages collected dextrously out of many approved Authours, against which I have nothing to say; onely he must give me leave to dissen tfrom him in his opinion concerning the Suns heat, when he sayes, that if the Sunne had been placed in the lowest spheare where the Moon is, by this vicinity to the earth its heat had been intollerable. What will he say then to that world lately discovered in the Moon by glasses as fallacious as the opinion is erroneous. Surely these people must live uncomfortably where the heat is so intollerable; or else they must have the bodies of Salamanders, or else of those *Pyruſte* in the Furnaces of *Sicily*: but indeed though the Sunne work by the Moon upon sublunary bodies, yet the Moon is not hot, nor capable of it, no more then the line is capable of that stupidity which from the *Torpedo* is conveyed by the line to the Fishers hands. No celestiall body is capable of heat, because not passive; except we will deny that quintessence, and put no difference between Celestial and Elementary bodies. The Sun then is not the subject but the efficient cause of heat; the prime subject of heat is the element of fire, the prime efficient cause is the Sun, which can produce heat, though he be not hot himself. And this is no more strange then for him to produce, life, sense, vegetation, colours



lours, odors, and other qualities in sublunary bodies, which notwithstanding are not in him, though from him. Again, if the Sun be the subject of heat, because he is the original and effector of it; then *Saturn* is the subject of cold, the Moon of moisture, and *Mars* of drinesse, and so we shall place action and passion, and all elementary qualities in the heavens, making a Chaos and confusion of celestial and sublunary bodies. Moreover, if the Sun's vicinity causeth the greatest heat, why are the tops of the highest mountains perpetually cold and snowy? Why doe there blow such cold windes under the Line, as *Acosta* sheweth? We conclude then, that the Sun is the cause of heat, though he be not hot; as he is the cause of generation and corruption, though he be neither generable nor corruptible. *Ovid* then played the Poet not the Philosopher, when he causeth the Sun's vicinity to melt *Icarus* his waxen wings.

II. He sayes, That *Islands* before the Flood are with probability denied by very learned authors. *Answ.* He doth not alledge any one probable reason out of these Authors in maintenance of this opinion. I can give more then probable reasons that there were Islands before the Flood, First, the whole earth it selfe was made an Island; therefore the Sea is rightly called *Amphitrite*, from encompassing the earth; For this cause *David* saith, That God hath founded the Earth upon the Waters. And though Earth and Sea make but one Globe, yet the Earth onely is the Center of the world, as *Clavius* demonstrates. 2. The world was in its perfect beauty before the Flood; but Islands in the Sea tend no lesse to the beauty and perfection of the world, then Lakes upon the Land. 3. All the causes of Islands were as well before the Flood as since; for there were great Rivers running into the Sea, carrying with them mud, gravell, and weeds, which in time become Islands. There were also Earth-quakes, by which divers Islands have been made, the vapour or spirit under the bottome of the Sea thrusting up the ground above the superficies of the water; and who will say, that in the space of 16. hundred years before the Flood there should be no Earth-quakes? Again, in that time the Sea had the same power over the neighbouring lands which it hath since the Flood. But we find that Islands were made by the Sea washing away the soft and lower ground in peninsules at this day; there doubtless the Sea wanted not the same force and quality before the Flood: for there were as forcible winds, and as impetuous waves. Lastly, Islands are made when the Sea forsakes some Land which it useth to over-flow; and this property



ry also we cannot deny to have been in the Sea before the Flood; for there were windes to beat off the Sea, & to drive together heaps of sand into some altitude, whereby the water is forced to forsake the land, whence hath proceeded divers Isles.

III. He saith (*Book 6. c. 4.*) *there were more then seven Ostia-ries of Nilus.* Answ. There were but seven of note, the other four were of no account, but passed by as inconsiderable: Hence they were called *ἑπτάστοματα*; therefore the stream of all waters run upon seven; so *Virgil*, *septem discurrit in ora.* And *Æn. 6.* *septem gemini turbant trepida ostia Nili.* Ovid calls the River *Septemfluus*; by others it is named *Septemplex*; by *Valerius*, *septem amnes*; *Claudius* gives it, *septem cornu*; *Manilius*, *septem fauces*; *Ovid*, *septem portus*; *Statius* *septem hiemes*; *Dionysius Afer*, *ἑπτάστοματα*. These seven mouthes have their particular names given them by *Mela* and other Geographers, and so the Scripture gives it seven streams, *Isajah 11. 15.* at this day there are but foure left, two of which are of little use; therefore the Doctor needed not to have troubled himselfe so much as he doth, because so frequently this is called the seven-mouthed river; for it is usuall to give denominations not from the exact number, but from the most eminent and major part of the number, He may as wel except against *Moses*, who in divers places reckons but seventy souls which went down into *Ægypt*; and yet Saint *Steven* in the *Acts* mentions 75 souls. Again, he dislikes the Title given by *Ortelius* to *Nilus* when he calls it *the greatest river of the world.* But *Ortelius* was not mistaken in calling it so; for it is the greatest, though not perhaps in length, because it may be some are longer, the which are not certainly known; yet in breadth when it overflowes the whole Countrey, in which respect it may be called rather a Sea then a River; and so it was called by the Ancients, as *Pior Valerius* sheweth. *Nile*, saith *Basil*, is liker a Sea then a River, and some esteem the length of it a thousand German miles, or 35. degrees, having Summer at the springs thereof, and Winter at the other end the same time. It is also the greatest in regard of use and benefit; for no River doth so much enrich a Countrey as *Nilus* doth *Egypt*. It is the greatest also in fame; for no River is so renowned in Writers. By the world also is meant so much as is known to us; for the Rivers of *America* are known rather by hearisay then otherwise. The greatness of this River was of old Hieroglyphically expressed by the vast body of a Giant. There is a Statue of *Nilus* in the *Vatican*, the picture whereof is in *Sands* his Travels, the



greatest of Poets, by way of excellency calls this the Great River, *In magno marentem corpore Nilum*. Again the Doctor will have Rome (magnified by the Latines for the greatest of the earth) to be lesser then Cairo; and Quinsay to exceed both. But he is much mistaken; for Cairo, as Sands tells us who was there, is not above 5. Italian miles in length with the suburbs, and in bredth scarce one and a halfe; whereas Rome was almost fifty miles in compasse within the walls, and the circuit of the suburbs much more, as Lipsius (*de mag. Rom. l. 3. c. 2.*) hath collected out of divers Authors: He shewes the greatnesse of it also by the number of the people therein; for there were three and twenty thousand poor which was maintained upon the publick charge; then if we reckon the multitude of rich men, and their train, which was not small: (for divers of the great persons; maintained families of foure hundred persons;) if we look upon the multitude of Artificers, of Seouldiers, of Courtiers, of strangers from all parts flocking thither, as to the great Metropolis and shop of the World, we shall find there were no lesse then four millions, or fourty hundred thousand people, which is more then can be found in many large provinces. *Heliogabulus* collected the greatness of this City by the Cobwebs found in it, which being gathered together, did weigh ten thousand pound. Another argument of its greatness may be collected out of *Eusebius* his Chronicle, who reckons that for many dayes together there were buried of the plague ten thousand daily. Not without cause then was Rome called the Epirome of the world; by *Aristides* *ἐργαστήριον τῆς γῆς* the Earths workhouse, and *ἀνεπίτηλις*, the worlds Citadel, or Castle; by *Saint John*, the great Citie, and the great Babylon; by *Virgil*, *Maximum rerum*. And it stood with reason that Rome should be the greatest of Cities, being the Queen and Mistress of the greatest Empire, of such large Territories, and full of people, Cities and Nations. Rome then was every way the greatest Citie, both in extent, in power, in people, in glory, in magnificence. What Citie ever had that multitude of stately Palaces, Temples, Theaters, Olisks, triumphant Arches, Baths, and other publick buildings, as *Laurus* sheweth? As for Quinsay in China, we have a fabulous narration in *M. Paulus Venetus*, that it was an hundred miles in compasse; but his narrations have been found erroneous, and if the Kingdome of China comes far short of the greatnesse of the Roman Empire, surely Quinsay must fall short of Rome, which as the Poet saith,

*Inter alias tantum caput extulit urbes,  
Quantum lenta solent inter viburna cupressi.*

As



As for Quinsay now it is not thirty miles in compasse, as *Nicolds de Contu* sheweth who was there. Again he saith, That this annual overflowing is not proper unto Nile, being common to many currents in Africa. *Ans.* It is so proper to Nile, that no other River doth so orderly, so frequently, so fully, overflow their banks as this doth. Crocodiles (saith he) are not proper to Nile. *Ans.* They are so proper, that no river either in Africk, Asia, or America, hath such Crocodiles as Nilus, if either we consider the magnitude, multitude, or fierceness of them; Other Crocodiles, chiefly the American, are gentle, the Egyptian fierce and cruel, which is the cause that Dogges are so afraid to drink out of Nilus, whence arose that proverb, *Canis ad Nilum*. The greatest Indian Crocodiles exceed not twenty foot in length, as *Scaliger* shewes; but those of Nile are three hundred foot long, whose jawes are so wide, that one of them can contain a whole heifer at a time: some have been found there of 25, and above 26. cubits in bigness, as *Ælian* reports. The Romans to shew how proper this beast was to Nile, represented Egypt by a Crocodile in that Coin on which *Augustus* stampd a Crocodile tied to a palm-tree, with this Inscription, *Primus relegavit*; for he subdued Egypt, and restored peace to them. Again he saith, That the Causes of Niles inundation are variable, unstable, and irregular, because some yeares there hath been no increase at all. *Ans.* He may as well say, that the causes of all natural effects are variable, because sometimes they faile: But all naturall causes operate for an end; therefore are constant, regular, and stable, so are not Chance and Fortune, which *Aristotle* excludes from naturall causes: Are the causes of rain, and storms irregular, variable, and unstable; because sometimes it rains more in Summer then in Winter? Or is generation irregular, because sometimes women miscarry? Naturall causes alwayes produce their effects, or for the most part so, that they faile but seldome, and that upon the interposition of some impediment, whereas fortuitall causes produce their effects seldome: The causes then of Niles overflowing, are not contingent, but certain, constant, regular, and stable; because they never faile, or but seldome upon some impediment in the producing of that effect. As for the Egyptian raines I have spoken elsewhere, (*animad. on Sir Walt. Raleigh,*) Now because of this regular, constant, and beneficial inundation of Nilus, it was called *Jupiter Ægyptius*, and divine honours were given to it, its annual festival was kept about the Summer Solstitial, when it overflows the land. This was called by the Greeks, *τὴ Νεῖλῳ* the



the Priests used to carry the water of *Nile* on their shoulders with great solemnity to their temples, falling down on their knees, and lifting up their hands, gave solemn thanks to *Jupiter Nilus*, to whose honour they dedicated a certain piece of coin with this Inscription, *Deo Sancto Nilo*.

## CHAP. XIV.

1. The cause of Niles inundation. 2. Lora wife truly transformed into a salt Pillar. 3. Hels fire truly black: brimstone causeth blackness. 4. Philoxenus a glutton, and his wish not absurd: How long necks conduce to modulation.

**T**He Inundation of *Nilus* (saith the Doctor) proceeds from the rains in *Æthiopia*. This I deny not, because averred by *Diodorus*, *Seneca*, *Strabo*, *Herodotus*, *Pliny*, *Solinus*, and others both ancient and modern Writers: and it stands with reason; for the Springs of *Nilus* are neere the Tropick of *Capricorn*, where it is winter when the Sun is with us in *Cancer*: then doth it rain abundantly in that Southern climat; for though within the Tropicks the Suns vicinity causeth rains, yet without his distance is the occasion thereof: His melting of snow upon the Hills of *Æthiopia* is a cause of this inundation. But *Scaliger* denies that there is any snow at all; yet I doe not think the high mountains there should be lesse subject to snow then in *Peru* under the line, although the people in the low Countries thereof be black, and the windes in the vallies warm. The third cause of *Nilus* overflowing, are the *Etesie*, or northerly windes, which blow there every yeare when the Sunne is in *Cancer*. This winde blowing into the mouth of *Nile*, keeps it from running into the Mediterranean sea. *Scaliger* refutes this reason, because at the same time the river *Nigir* which runs into the Western Ocean, overflows his banks; but to this I can easily answer, That at the same time there be different *Etesie*, or constant windes in different regions of the world; so that whilst the North wind blows against *Nilus*, the West or Southwest, which also as *Acosta* saith, is predominant upon the coast of *Peru*, blowes against *Nigir*. As for the original of *Nilus*, it hath been still held uncertain; *Pliny* writes that King *Jubia* found out the springs thereof in the *Mauritanian* Mountains; but since, this river hath been found as far as the lake *Zaire*, which is in ten degrees of Southerly latitude. The *Ægyptian* Sultan did spare neither for men nor cost to search out these springs, but



but could not find them; therefore *Virgil* calls these streams of *Nilus*, *Latebrosa flumina*. *Herodotus* witnesseth, that neither *Ægyptian*, *Grecian*, nor *African* could resolve him any thing of *Nilus* springs. Hence in *Homer* *Nilus* is called *Συνετης*, that is, falling or descending from *Jupiter*, because God onely knew the original of this river.

The Doctor (*book 7. c. 11.*) will not question the metamorphosis of *Lots* wife, whether she were transformed into a reall statue of salt, though some conceive that expression metaphoricall. That the expression is not metaphorical, but the transformation real, is manifest by the testimonies of the Rabbins, by the *Thargum* of *Jerusalem*, by the best expositors, by *Josephus* and *Borchardus*, in whose times that statue of Salt was yet extant; besides divers reasons doe evince the same: For it was as easie for God to turn her body into a salt Pillar, as to turn *Moses* rod into a Serpent, *Nilus* into blood, *Nebuchadnezzar* into a beast. 2. We see daily transformations in generation, and in our own nutrition. 3. Nature can transform mens flesh into Worms, Calves flesh into Bees, Horses and Asses flesh into Wasps and Hornets. We read also of Birds procreation out of old Timber, of *Japonian* dogges transformed into fishes, of water turned into stones, and of an Oyster metamorphosed into a Bird, which was presented to *Francis* the first of *France*. 4. The Magicians of *Egypt* transformed divers substances, and the Devil by Gods permission hath often done the like; examples of which may be seen in *Spuedanus*, *Camerarius*, *Peucerus*, and others. 5. The Gentiles who laugh at this transformation are convinced by their own stories or Fables, of *Ulysses* and his fellowes transformed into beasts; and of *Diomedes* his companions metamorphosed into birds; if they can believe these changes, why should they doubt of *Lots* wifes transmutation?

III. To conceive a general blacknesse in hell, and yet therein the material flames of sulphur, is no Philosophical conception, nor will it consist with the real effects of its nature. Answ. What though this were no Philosophical conception, nor consisting with the effects of Nature, is it therefore untrue? God is not subject to Philosophical conceptions, nor to the lawes of nature who could make fire to burn, but not consume the bush, and make the fiery furnace burn the Chaldeans, and yet not singe a haire of the three childrens cloathes; the same power can make blacknesse and the flames of sulphur dwel together in hell; and which is more, he can make fire, which naturally is accompanied with light, to be the subject of darkness in Hell. But the Doctor



Doctor is deceived by his experiments, who thinks that sulphur affords no blacking smoak; for I know the contrary by blacking paper with the smoak thereof. Besides, both Philosophers and experience tell us, that the sulphurous vapours which in thundering and lightning break through the clouds, do make black the things touched with them; so saith *Aristotle*, *Pliny*, and others: And though Brimstone make red Roses and Tiffany white, it wil not therfore follow that it will make any thing white; the Sun beams which whiteneth the Linnen, tawns the skin; and if the whitning of things by sulphur, proceeds as he saith from its drying and penetrating quality, much more would all things be whitened by the Sun and fire, whose heat is more penetrating and drying; but we see how many things by them are blackned; and the very heat of the fire will induce blacknesse upon paper, though there come no smoke at all to it. He therefore who long since destroyed *Sodom* with fire and brimstone, will with the same materials punish the wicked in hell, where shall be in stead of light, blackness and darkness.

IV. *Philoxenus the Musician desired a Crains neck, not for any pleasure at meat, but fancying thereby an advantage in singing, (Book 7. c. 14.)* Answ. That this *Philoxenus* was a glutton, ancient Historians do affirme, and that he wished a Cranes neck to enjoy the longer pleasure of meat and drink, is asserted by *Aristotle*, *Athenaus*, *Machon* the Comick, *Ælian* and others: *Machon* sayes, that he wished a neck of three cubits long. He was a great Fish eater, therefore was nick-named *Phyllichthys*, and *Solenista* from *Solenes*, a kind of Oysters which he delighted in. Being one day at Table with *Dionysius* the tyrant, he had a small mullet set before him, which he takes up in his hand, and holds to his eare; *Dionysius* asks what he meant by that? He answers, that he had asked advice of *Galatæa*; but she sayd that she was too young to advise him; and that he were best to consult with the old *Galatæa* in *Dionysius* his dish: At which the Tyrant laughing, gave him the great Mullet that he had before him, which was very pleasing to the glutton. This story is recorded by *Celius Rhodiginus*, and doubtless that proverb, *Collaria cadavera*, that is long necked carcasses, which *Erasmus* borrowes from *Aristophanes*, hath relation to this wish of *Philoxenus*; for by it are meant Gluttons and Drunkards, who being buried in sleep and wine, are little better then dead carcasses with long necks, as this *Philoxenus* was, whose belly was his God; of whom it is recorded, that when he saw a dish of good meat, he would spit upon it, that he might enjoy it all alone: Yet the



the Doctor denies this wish upon no other ground, but because ~~it~~ was absurd. Sure this is no ground at all; for it is no unufall thing with Gluttons and Drunkards, both to wish and doe absurdly. His wish was not so absurd as that of *Midas*, vvho vvished all he touched might become gold; or that of *Heliogabalus*, vvho vvished and longed that he might eat the *Phoenix*, being the onely single bird in the World. Again, this vvish of *Philoxenus* was not so absurd as the Doctor thinks: for though the Tongue be the organ of tast, yet the Oesophagus cannot be altogether tastelesse, seeing there is one common membrane which is nervous to it and the Tongue. Now the membrane of the Tongue is the medium of tast: vvill any man say then, There is no tast or pleasure in deglutition? We find by experience, how unpleasant to the throat is the discent of bitter pills, or potions; so that I could never yet swallow a bitter pill, be it never so small. That there is much pleasure in deglutition of sweet meats and drinks, is plain by the practice of those vvho to supply the vvant of long necks, use to suck their drink out of long small Canes, or Quils, or glasses with long narrow snouts: And others for vvant of these vvill tipple leasurely, and let their liquor glide down the throat gently and by degrees: therefore doubtlesse *Philoxenus* knew that a long neck conduced much to the pleasure of eating and drinking, which made him vvish for a Cranes neck, that he might enjoy for some longer time the relish of his delicate viands, which gave the name afterwards to dainties and sweet meats; for they vvere termed *Placenta Philoxenia*. Again, when he saith, That it had been more reasonable if *Philoxenus* had wished himselfe a Horse; because in this animall the appetite is more vehement; he is deceived, for the vehemency of the appetite is no pleasure, but pain; there is no pleasure in hunger and thirst, but in eating and drinking. And indeed there is no reason that he who loved fish and sweet meats so well, should wish himselfe a Horse, vvho must content himselfe vvith Oats and Hay, and sometimes vvith dry straw, without any sawce; he should rather have vvished himself to have been *Apuleius* his Asse, who sometimes filled his belly with good pies, and other dainties. Lastly, when he saith, That canorous birds have short necks, and that long necked byds are not muscical. I answer, It is not the length of the neck that hinders medulation, but the wideness thereof: For which cause youth before puberty, women, & Eunuchs, have more melodious voyces then men, whose *apera arteria*, vvith other vessels, are dilated by the heat of the Testicles: For  
other-



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therwise we find that the length of the neck is ahelp to fingings: Hence birds thrust out their necks when they chant, which the Poet intimates when he saith,

*Longa canoros dant per colla modos.*

Therefore the proportionable length of wind-instruments doth conduce to modulation.

## CHAP. XV.

1. Heavy bodies swim in the dead sea: and the Ancients in this point defended. 2. Crassus had reason to laugh at the Afs eating Thistles: Laughter defined: in laughter there is sorrow; in weeping, joy. 3. That Christ never laughed, proved. 4. *Fluctus Decumans*, what?

THat heavie bodies will not sink in the Lake *Asphaltites*, or dead sea of *Sodome*, is affirmed by *Aristotle*, *Solinus*, *Diodorus*, *Justin*, *Strabo*, *Plutarch*, *Josephus*, and others, and confirmed by the practice of *Vespasian*, casting into that lake captives bound, vvho floated and sunk not: Besides that, it stands with reason; for salt vvater will support heavie burthens, much more will that vvater which is thickned with a forcible ebullition of Sulphur and Bitumen; yet the Doctor (*Book 7. c. 15.*) will not believe but that heavy bodies doe sink there, though not so easily as in other waters. Therefore rejects *Pliny's* swimming of Bricks, *Mandevils* Iron, and *Munsters* burning Candle, which sinks not there, as fabulous; yet all this may be true: for the ebullition may be so forcible, the water so thickned with the Bitumen, the sulphurous vapours and spirits so violently tending upward, that they may waft up Bricks and Iron, and not suffer them to sink. A greater wonder then this may be seen in those that write of *Aetna*, *Vesuvius*, the burning hills of *Island* and *America*, whence are belched out and elevated into the air, great stones by those fiery vapours which issue out of those *Vulcans*. Within these twenty years *Vesuvius* cast out great stones above twenty miles distance. And therefore it is no such wonder for a burning Candle to swim, which being extinguished, sinketh; for the flame adds levity to it. But let us see the Doctors reasons, 1. *Josephus* (saith he) affirms that onely living bodies float, not peremptorily averring they cannot sink, but that they doe not easily descend.



scend. *Ans.* The words of Josephus are these (*de bel. Jud. l. 5. c. 5.*) *The most heavy bodies that are being cast into this Lake, float upon it, neither can any man be easily drowned there, though he would.* Here Josephus speaks both of living bodies, that though they would, they cannot sink easily; they may force themselves perhaps to dive under the water, but not without difficulty, and he speaks also of the heaviest things in generall. Aristotle (saith he) speaks lightly thereof, ὥσπερ μυθολογῶσι, and esteemeth thereof as a Fable. *Ans.* Aristotle speaks not lightly but seriously of this Lake; for from the quality of supporting heavy bodies, he deduceth one of his prime Arguments to prove the falsedinous quality of the Sea. But the Doctor deceiveth himselfe in the word μυθολογῶσι, as if this did still signifie a fabulous relation; whereas in that place, and elsewhere, it signifieth a serious narration. So *confabulari* in Latin doth signifie conference of serious matters for the most part: μυθῶσι is to speak, not to tell Fables, from μῦθος, a word or speech. In Homer, *νεαῖ ἐρὸν δ' ὅππ' μυθὸν ἔτελλε*, signifieth a grave and serious speech made by Agamemnon. So in the same Poet, *μυθολογέει* is to speak and discourse. The like in Phocylides, *μέτρον μὲν φαγεῖν πιεῖν καὶ μυθολογεῖν* is to be moderat in eating, drinking, & speaking. Andrew Thevet (saith he) saw an Asse cast therein and drowned. *Ans.* So saith Camerarius indeed, and I will not question the truth of Thevet's narration; there may be diuers reasons of this, the violent hurling of the Asse with his burden under the water. 2. His sudden suffocation by the sulphurous exhalations. 3. The Lake in all places thereof, and at all times, hath not the same violent ebullitions, but sometimes there is remission. The Asse then might sink in such a place, and at such a time when and where the boiling was remiss, the vapours weak, and the water thinner then in other parts of the same Lake. But hence it will not follow, that in other parts, and at other times, the heaviest bodies may not swim there.

II. That Crassus never laughed but once, and that was at an Asse eating Thistles, seems strange to the Doctor, yet he gives no reason for this, but only that the object was unridiculous, & that laughter is not meerly voluntary. But these are no reasons: For a more ridiculous object there cannot be, then to see such a medley of pleasure and pain in the Asses eating of Thistles; for whilst he bites them, they prick him, so that his tongue must needs be pricked, though perhaps his lips may be hard, and not so easily penetrable; whence arose the Proverb, *Like lips, like nettice*. But there was something else in this that moved Crassus to laugh:



laugh: For he saw here the vanity both of most men taking pleasure in those things which are accompanied vwith much pain and sorrow: Besides, he saw here the folly of the Roman rich men, who held Thistles such a dainty dish, that they would not suffer poor men to eat thereof, engrossing them vwith great summes of money to themselves, vvhich notwithstanding the Asses did eat on free cost. Was it not then a ridiculous thing to see rich men pay so dear for Asses food, and to debarre poore men from that meat which they permitted to Asses? *Pliny* could not but laugh at the consideration of this folly. 2. When he saith, that *Laughter is not meerly voluntary*, he can inferre nothing from hence, except this, That it was as naturall for *Crassus* to laugh, as for others; which I deny: For some are more naturally inclined to it then others; all have not the like temper and constitution of body, some have hard and solid hearts, heaue and pensive spirits, which no ridiculous object can move to laugh; these are called ἀγέλαστοι. There be others again who can never be moved to weep. But he gives us here a lame definition of laughter, when he sayes, *It is a sweet contraction of the Muscles of the face, and a pleasant agitation of the vocall organs*. These are but the effects of laughter, the cause is the softnesse and agility of the heart, the cheerfulnesse and levity of the spirits, moving first the Diaphragma, and by them the Muscles. Again, there is a laughter called *Sardonius*, which is accompanied vwith a contraction of the Muscles; but this is not sweet, yet it is laughter; and in singing, vvhich is not laughter, there is an agitation of the vocall organs, accompanied vwith pleasure. Lastly, whereas he condemneth *Heraclitus*, who by his weeping made a hell on earth; he is deceived: For oftentimes there is hell in laughing, and a heaven in weeping; in tears there is often delight, and in laughing pain, and as *Solomon* saith, *Madnesse*. *Aristotle* saith (1. *Rhet.*) That there is in sorrow and tears a certain sense of pleasure; and as *Prudentius* saith,

*Gaudia concipiunt lachrymas, dant gaudia fletum.*

{This is δακρυγενᾶ. Teares (saith *St. Ambrose*) feed the mind, and ease the heart, vvhich *David* found vwhen he said, *My tears have been my meat day and night*. Good men therefore found not the uncomfortable attendments of hell in weeping, but rather the comfortable enjoyments of heaven.

III. The Scripture witnesseth, that *Christ* wept thrice, but never that he laughed. The Doctor thinks there is no danger



to affirm the act and performance of that, whereof we acknowledge the power and essentiall property, and whereby he convinced the doubt of his humanity. *Ans.* We deny not but there was in Christ, by reason of his humanity, the faculty of risibility; yet it will not follow that therefore he did actually laugh: For this act is rather a property of levity and folly, then of reason and humanity; therefore we see women more inclined to laughing then men, childhood then old age, and fools then wise men. Neither needed Christ to prove his humanity by laughing, he proved it sufficiently by weeping, which is the first demonstrative act of our humanity as soon as we are born; onely Zoroastres the author of Magick, came like a fool laughing into the World. Again, he saith, *We need not fear to adscribe that to the incarnat Sun, which is sometimes attributed to the uncarnat Father.*

*Ans.* From a metaphoricall laughing which is adscribed to the Father, to a naturall and reall laughing in the Son, can be no consequence. God laughs figuratively, therefore Christ laughs really, is as good a consequence, as if I should infer, that man flieth naturally, because God is said to flie tropically. Lastly, he saith, *It is not reasonable to conclude from Scripture negatively, in points which are not matters of Faith.* *Ans.* It is true, vwhere the Scripture speaks superficially, and by the way of any thing, divers circumstances are omitted, in which regard we may not conclude negatively; but where the Scripture speaks exactly, as it doth of our Saviour, vve may reason from the negative. For no lesse then four Evangelists write the story of Christ so fully, that they mention all his passions and affections, as his anger, joy, sorrow, pity, hunger, thirst, feare, wearisomnesse, &c. They speak that he mourned three severall times. So when the Prophets describe him, they set him out as a man of sorrowes, acquainted with griefes, smitten of God, and afflicted, wounded for our transgressions, bruised for our iniquities, and stricken for our sins. It is strange then, that neither Prophet, Historian, Apostle, nor Evangelist, should speak a word of his laughing, and yet so punctually mention to us his griefes, sorrowes, and weeping: therefore not without cause did Chrysostome, Austin, Basil, Bernard, and others, conclude negatively, That Christ never laughed, and yet he did not for this cease to be a Man. For the like is recorded of Crassus, Grand-father to that Crassus who was killed in the Parthian war; who (as is said) never laughed but once. It is also recorded of Anaxagoras, Aristoxenes, Socrates, Cato, Nerva the Emperour, and others, that they were never seen to laugh. Besides, seldome or never



is laughing in Scripture taken in a good sense; it is called madness, and like the cracking of thorns: laughing is threatned to end in sorrow, and woe is denounced to those that laugh; but a blessing to the mourners. As for the priority of the heart above the brain, whereof the Doctor speaks here, I have already proved out of Aristotle, and it is plain that in the Scripture it is of greater account then the brain, because this is never mentioned, but still the heart, let Physicians say what they wil for the brains principality.

IV. That *Fluctus decumanus*, or the tenth wave, is greater or more dangerous then any other, &c. is evidently false. Here the Doctor troubles himself to no purpose, in refuting the greatness of the tenth wave, and tenth egge: For the tenth of any thing was not counted the greatest, but the greatest of any things was called by the name of Tenth; because that is the first perfect number, as consisting of 1, 2, 3, and 4. It was also held a sacred number; therefore the tenth of spoils was dedicated to *Hercules*, and from him called *Herculan*, the tenth of fruits was paid by the Corinthians to *Cyphelus* their King, by *Cyrus* to *Jupiter*, by the Arabians to *Sabis*, and long before by *Abraham* and *Jacob* to the true God. When there was yet no positive law, but the law of Nature. In the number then of Ten, the Ancients conceived there was perfection and excellencie: For Nature perfects man, and brings him into the world the tenth moneth; she hath parted his hands into ten fingers, his feet into ten toes: she hath given him ten passages for evacuation, in three ten dayes the male child is formed in the womb, in foure ten dayes the female: there be ten Heavens; they made up their musick of ten strings, their year of ten moneths, *Apollo* with the nine Muses made up the full consort, they used to drink but ten times in their Feasts, the womans Dowry anciently was ten *Sestertia* at least; and the greatest ordinarily decies *Sestertium*, that is ten hundred thousand pounds, of our money 7812. l. 10. s. Many other observations may be made of this number; therefore any thing that was greater then another, was called *Decumanum*. *Porta decumana* was the great gate of the Camp. *Limes decumanus* in grounds, was from East to West; *decumana pyra* in *Pliny*, are great Pears; *Decumatio* was the calling forth of every tenth delinquent in an Army for punishment: And *Lipsius* thinks that from them the great gate of the Camp out of which they went, was called *Decumana*. This number also of Ten is musical in Scripture, as may be seen in divers passages thereof. Now whereas he saith, That the Greeks expresse



expresse the greatest wave by the number of three, as their word *τρι-  
κυμια* shewes. This he hath from *Erasmus* in his *Adagies*: but  
I think the word is not from *τρια*, three, but from *τριω*, I fear;  
so this *τρικυμια* is not the third wave, but the most terrible &  
greatest wave. Hence the Latin *Decumanus* should be rendred  
*τρικυμια*, not *τεκυμια*.

CHAP. XVI.

1. *Epicurus, a wicked and wanton man, impious in his opinions.  
Seneca's judgement of him.* 2. *Twelve of his impious and ab-  
surd opinions rehearsed.*

**T**HE Doctor is very prodigall of his pitie, when he cries  
out, *Who can but pitie the vertuous Epicurus, who is commonly  
conceived to place his chiefe felicity in pleasure and sensual delights,  
&c. But these pleasures were of the mind, not of the body.* *Gassendus*  
indeed hath taken much needlesse pains to vindicate *Epicurus*  
from his errors and impiety; but in this he washeth a Brick, or  
Blackmore: his chiefe supporter is *Diogenes Laertius*, an obscure  
Authour in former times: for no ancient Writer speaks of him;  
and he cites more Philosophers then (it's thought) he ever  
read. This *Laertius* lived 450. years after *Epicurus*, that is, in  
the time of *Antonius pius*, about 150. years after Christ; where-  
as *Epicurus* lived almost 300. years before our Saviour. Now  
how he should come to know more of *Epicurus* then those Phi-  
losophers who were contemporary with him, even his own dis-  
ciples, who writ the life and doctrine of that wanton garden  
Philosopher; is a thing to be questioned, and to indifferent  
men improbable: For whatsoever *Gassendus* out of this *Laertius*,  
writes of his commendations, yet we find in the writings of  
ancient Philosophers among the Gentiles, and primitive Doc-  
tors among the Christians, that he was a man lewd in his con-  
versation, and monstrous in his opinions; so that ever since he  
opened his Schoole till this day, a wanton Atheist is called an  
*Epicure*. *Sine vano publica fama.* Sure there could not be so  
much smoke without some fire; and to say that his contempo-  
rary Philosophers, chiefly the Stoicks, should out of malice  
write untruths of him, is very improbable: For to what end  
should they doe so? And why more against him then any other?  
Besides, if he was innocent, why did he not vindicate his own  
reputation by writing? Why did not his Scholars stand up in



his defence, how came it that in almost five hundred years he was branded by the tongues and pens of all men, and no man all that while stood up to cleare his reputation, till *Diogenes Laertius* produced three of his Epistles, which wise men may think to be fictitious; and the rather because they contradict what his own Scholars, and ancient Philosophers have recorded of him. For *Timecrates* his beloved Disciple, and one whom he made one of the Executors of his last will, writes, that with excesse of eating and drinking he used to vomit twice a day. And *Laertius* himself is forced to confesse, that he killed himselfe in the Bath with drinking too much sweet wine, and so he shewed himselfe to be *Epicurus* indeed. He was so decrepid the later part of his life, that for many yeares together he could not rise out of his chaire, he had so enervated his body with pleasures, wherein he placed his felicity. Is this the Doctors vertuous *Epicurus*, who spent every day a *Mina*, vvhich was an hundred *Drachma's*, that is, 3.l.2.s.6. d. every *Drachma* being 7.d.ob. I confesse onely *Seneca* among the Stoicks speaks favourably of *Epicurus* his opinion concerning pleasure, as if he meant of mentall delights (*lib. 1. de vit. beat.*) yet withall checks him, shewing that his commending of pleasure was pernicious, because voluptuous men upon this took occasion to hide their luxury in the bosome of Philosophy, and to cover their wantonnesse with the patrociny and mantle of pleasure: Therefore elsewhere he calls him, The Master of pleasure, and one who too much yeelded to the delights of the body. *Seneca* therefore by speaking favourably of *Epicurus*, would keep off voluptuous men from making him their patron of sensual pleasures; and was loath that the sacred name of Philosophy should be bespattered by such an impious professor: His intention in this was good, but yet truth should take place. Neither doth the honour of a holy profession depend upon the quality of the professor; though wicked *Judas* vvas an execrable Apostle, yet the Apostolicall function is sacred. But perhaps it may be objected, That *Epicurus* did oftentimes use to fast, and content himself with bread and water. I answer, That there is a pleasure sometimes in fasting, as well as in feasting: the nature of man delights in change; if it were not for abstinence sometimes, we should not know the delight of fulnesse; darkness commends the pleasure of light, and Winter adds to the delight of Summer. There is a vvearifomnesse in continual feasting, which takes away pleasure. therefore *Epicurus* to maintain an alternate vicissitude of delights, would interchangeably



changeably fast and feast. But his abstinence was to increase the pleasure of his intemperance; and his intemperance was to add delight to his abstinence. Beside that, he was necessitated sometimes to fast for his healths sake, and enjoyment of a long life, which could not consist in continuall surfeiting. *Seneca* (in *Epistol.*) also reproves *Epicurus* for his inconstancy in saying, That vertue is never without pleasure; and yet affirms that it is not the vertue but the pleasure that makes a man happy. A foolish distinction saith he: For if Vertue be never without that which makes a man blessed, then vertue it selfe is sufficient to beatitude, and that perfectly; for otherwise an imperfect felicity is infelicity. Again, in his Book of Benefits he tells *Epicurus*, That vertue is to be desired for its selfe, not for its pleasure, which he proves out of his own Doctrine of God: though he hath disarmed him of all power, excluded him from all commerce and care of Man, yet he worships him for his greatnesse and goodnesse, though he have no benefit by him, nor is afraid of any hurt from him. Again, he commends many of *Epicurus* his sayings, not because they were his, but because they were common Principles and Tenents used by him, *Non quia Epicuri voces, sed quia publice*. Another reason he gives, because some sayings are rare and unexpected out of his mouth, whose doctrine and practice was so lascivious: and therefore he commends his sayings more then his actions: he says he was *fortis, sed manuleatus*, a brave man, but vvithal debauched and effeminate; brave in his sayings, but debauched in practice. *Ignava opera Philosophia sententia*. As there be too many like him, Stoicks in opinion, and Epicureall in conversation; by nature saith the Comick, we are all prone to pleasure & lasciviousness, *a labore proclives ad libidinem*. *Arcefilaus* being asked why so many of other Sects revolted to *Epicurus*, but none fell from him to them, answered, That Cocks can be easily made Capons, but Capons could never become Cock again. It is easie to become and turn a Priest of *Cybele*, but not so easie to return. *Facilis discensus Averni, sed revocare gradum, supera que evadere ad auras, hoc opus hic labor*. Broad is the way that leadeth to destruction, but the gate to salvation is narrow, and few enter thereat. *Seneca* also checks that Master of the Revel for saying, In contented poverty there is much honesty: For how can he be poore that is content? It is content that maketh rich, discontent poore. He plainly bids defiance to *Epicurus* his opinion of pleasure, in his fourth book of Benefits, calling his Sect effeminate, umbratick, trencher Philosophers, making ver-



tue the hand-maid to pleasures, which ought to be the Mistress, enslaving her to her Vassals, which she ought to lead, to command, to keep under; he calls it a manifest blindness in them to set the Cart before the Horse, to prefer pleasure before Vertue, to set that first which should be last: And not onely is he angry for advancing pleasure, but for joyning it with Vertue at all, which scorns pleasures, and accounts them her enemies, desiring rather the acquaintance and familiarity of pains and labour, then of such an effeminate happinesse as pleasure. Now that these pleasures of *Epicurus* are not mental, but corporal, the same *Seneca* (whom the Doctor cites for his defence) makes it appeare in the 13. Chapter of the same book; Your pleasure, O *Epicurus*, saith he, is to accustome your tender bodies to dull idlenesse, to a sleepey security, in the heat to delight your selves in cold shades, to solace your drooping souls with wanton thoughts, and to cram your lasie karkasses with good meats & drinckes in your shady gardens. Any man therefore may see that *Epicurus* his God was his belly, and gormandising his chiefe happinesse. Wherefore *Athanasius*, lib. 7. shewes, that he flattered *Idmeneus* and *Metrodorus*, τὸν γαστρός ἡνέκεν, for his bellies sake. The same *Seneca* also rejects *Epicurus* his impious opinion of God, whom he makes as idle as himselfe, sitting in another world secure and careless of humane affaires, acting nothing at all, which is *Epicurus* his chiefe happinesse, and taking no notice of our injuries and benefits. If this were so (saith he) the world had been made to sollicite such deafe and impotent Deities with vowes, supplications, and lifting up of hands: Thou O *Epicurus* (saith he) hast disarmed God, and taken from him all his darts and power, so that he is not to be feared of any; thou hast secluded him from this world by a wal or rampire, so that he can neither see nor feel what is acted here. Hence then it is plain, that *Seneca* was no supporter of *Epicurus*, though he commends some of his moral sentences, not because they were his, but because they were common; and what greater commendation is it for him to speak some good sentences, then for the Devil to utter Scripture phrases. Lastly, *Seneca*'s commendations, (if any such be) of *Epicurus*, are of no great moment, seeing with him he doubts of the soules immortality; when he saith, *Illa quæ nobis inferos faciunt terribiles fabula est*, &c. Conf. ad Marcian.

II. But that we may have a more full view of this swinish Philosopher, whom the Doctor commends for his vertue, long life, and many books, we wil poynt at some of his absurd and impious



impious tenents, that *Gassendus*, and other phantastical heads of this wanton age, may see what a goodly School of Philosophy they would open here in Christendome. 1. He rejects Logick, calling it, as *Laertius* tells us *παρέλκουσιν*, superfluous, or preposterous, whereas it is the most usefull of all human Arts or Sciences; for without Logick we can neither define, nor divide, nor distinguish, we can neither tel the essential nor accidental differences, nor identities of things; we can neither discourse or reason, speak or write methodically, we can inferre no conclusion from any premises, nor find out probable and demonstrative arguments for proof of any thing, nor detect the fallacies and captions that are in mens discourses. But it is no wonder he denyes the Art of Reasoning, who knew not what Reason was; for he confounds it with the senses, as if it had its essence and being in and from them. And in his Epistle to *Phythocles*, he would not have his happy men to meddle with any knowledge or discipline at all. 2. He makes a difference between *τὸ πᾶν*, the Universe and the World; affirming that there is but one Universe, but innumerable Worlds subject to continual generation and corruption; a position repugnant to Divinity, Philosophy, sense and reason. 3. He makes a certain space between his worlds, which he calls *μετάκοσμον*, *Tully* translates it *intermundium*, there he places his idle and carelesse Gods sleeping securely, as not being troubled with noyse, rumblings and clamours of this tumultuous world. 4. He saith that the Sun, Moon and Starres were made a part by themselves, *καὶ ἀντὰ*, and afterward were palces in this. 5. He will have the just magnitude of the Sun and Starres to depend upon our senses, and to be no bigger then they seem to our eye; so that the bignesse of the Sun cannot exceed a foot. 6. He tels us that the Sun every night perisheth, and every day is generated. 7. He acknowledgeth no other happinesse then what consists in the pleasure of tasting, smelling, seeing, hearing, feeling, or venery, as may be seen in *Laertius*. 8. He makes all things to have their existence not by providence, but by hap-hazard of Atoms, and not the bodies of things onely, but the reasonable souls of men also, which he makes subject to uncertainty. 9. He makes all the Gods *ἀνδρωπώειδες*, with humane shapes. 10. He teacheth, as *Plutarch* tels us, that there is no qualities in things, but what the senses apprehend; so that the same wine may be both sweet and soure, according to the palat that tast it; and hot water is not hot but coole, if a man conceit it to be so. 11. He makes his doctrine fit for all mens humours; he commends



wealth to the covetous, discommends it to the prodigall and riotous; he praiseth gormondising to the Glutton, dispraiseth it to the abstemious: he tells the continent venery is hurtful, but to the wanton that it is delightful and pleasant. 12. He sheweth himself to be a prophane Atheist in despising Religion, making it a tyrant to keep men in aw, a pernicious device and a scar-crow to terrifie and enslave the vworld. And now lest any might think that *Epicurus* is wronged, and that these damnable opinions are fathered upon him causlessly, I will not alledge *Cicero*, *Plutarch*, *Laërtius*, and others that have professedly written against him, but his prime Scholar *Lucretius*, who highly commends him, as being the first that freed the World from the bondage and slavery of Religion: His words are these:

*Humana ante oculos fæde quum vita jaceret  
In terris oppressa gravi sub religione,  
Quæ caput à cæli regionibus ostendebat  
Horribili super adpectu mortalibus instans:  
Primum Graius homo mortales tendere contra,  
Est oculos ausus, primusq; obsistere contra:  
Quem neq; fama Deum, nec fulmina nec minitanti  
Murmure compressit cælum, &c.*

And so he goes on, glorying in the conquest and victory that *Epicurus* had got over religion, *Quare religio pedibus subiecta vicissim obteritur, nos exæquat victoria cælo*. His other wicked and absurd opinions, you may see mentioned and commended by the same Poet through all his Poem; so that the Doctor hath no reason to complain that *Epicurus* is wronged, and much lesse cause hath he to commend and pity so prophane and absurd a Writer, & to call him vertuous who was the greatest enemy that ever vertue had. Neither are his many Writings, or long life, arguments sufficient to prove him an honest man. I shall not need spend time and paper in refuting the senselesse and wicked Dictates of *Epicurus*, being fully refuted already by divers eminent Writers, both Christians and Gentiles.



CHAP. XVII.

*Epicurus his Atomes rejected by nineteen reasons.*

**B**Ecause the Doctor speaks oftentimes in his Book of Epicurean Atomes, which first were hatched in the brains of *Leucippus*, then entertained by *Democritus*, and by him recommended to his Scholar *Epicurus*; and because some giddy heads of this age loathing wholesome doctrine, desire to embrace any trash, like women troubled with the *Pica*, who preferre ashes, chalk, coals, tarre, and such like stufte, to nourishing meats. I will propose to the Readers view, the absurdities of this whimsical opinion concerning Atomes, that they may see how little reason there is to fill young brains with such empty phantasms, and to reject *Aristotles* wholesome and approved Doctrine of Principles. The inventors of these Atomes at first, out of a vain-glory that they might seem singular, rejected the common received principles of naturall Bodies, obtruding on the World their idle dreams; which are greedily embraced by the vain-glorious wits of this age, but upon what grounds let us see: 1. Either many bodies are made up of one atome, or one body of many atomes. But neither are true; not the first, because an atome is indivisible; not the second, because they cannot unite together in respect of vacuity in which they are distant from each other. 2. It is a maxime among them (saith *Aristotle*) That there is no passibility but by the means of vacuity. Now atomes have no vacuity in them, because they make them solid, therefore they are not subject to passibility; it will follow then, that where there is no passion, there can be no action; for passion is the reception of action, and therefore where no patient is, there no agent can be, because that is wanting on which the agent should act. Hence it will follow, that where there is no action and passion, there can be no generation. 3. There can be no action where there is no contrariety; but contrary qualities are not in atomes: for *Leucippus* (as *Aristotle* saith) placed heat in them, but not cold; hardnesse, but not softnesse; gravity, but not levity. 4. These Atomists contradict themselves: for they hold their atomes impassible, and yet place in them degrees of qualities, making some heavier then others; by which it will follow, that some atomes are hotter then others, and consequently they cannot act one upon another: For the greater heat acts upon the  
lesser,



lesser, as the stronger upon the weaker. 5. If compounded bodies are made up of atomes, then the qualities which are in these bodies, were first in the atomes, or were not; if not, whence have compounded bodies their qualities, being they are not in their principles? If they are in atomes, either they are singly, so that in each atome there is but one quality, as frigidity in one, hardnesse in another; or else there be divers qualities in one atome. If the first be granted, then it will follow, that each atome hath a different nature from the other, and so no possibility for reception of the quality of another, and consequently no action; if the second be granted, then it will follow that atomes are divisible: for there must be one part for reception of one quality, and another part for the other quality. There must be also besides, integrall parts, matter and form, act and passibility, which we call essential parts; so will it follow, that atomes are compounded bodies, which cannot be principles. 6. The uniting of these atomes must be either by themselves, or by another; if by another, then they are passible, which is repugnant to *Democritus*; if by themselves, then they are divisible into parts, to wit, into the parts moving, and the parts moved: For nothing can move it selfe; because contrarieties cannot be in the same thing *secundum idem*. 7. They make some of the atomes to be soft; it will follow then, that some of them are passive: for soft things are apt to receive impressions, and so to suffer. 8. If these atomes be smooth and round, as some will have them, they can no more unite to make up a mixt body, then so many small seeds or grains, which onely make up a body aggregate, as a heap of stones; but if they be rough, cornerd, or hooked, as others say, then they are divisible, and so not atomes. 9. If there be innumerable worlds, as *Epicurus* holds, and innumerable atomes must concur to make up any one of these Worlds, how many innumerable atomes are there to make up innumerable Worlds? There must needs be more atomes then Worlds, and consequently degrees of more and lesse in innumerability and infinity, then which nothing can be more absurd. 10. If all things are made of atomes, to what end was seed given to vegetables and animals for procreation? What needs the Husbandman sow corn, or the Gardiner cast his seeds into the ground? What needs he dig or plow, plant, & water, whereas all fruits, herbs and plants, can be produced by atomes? Birds, saith *Lactantius*, need not lay eggs, nor sit upon them for procreation, seeing of atomes both eggs and bird

cans



can be produced. 11. The souls and their faculties are made of finer and smaller atomes then the bodies which are compounded of a grosser sort. It must then follow they have degrees of magnitude, and consequently divisibility. 12. Those atomes have neither knowledge, reason, wisdom, nor counsel, and yet can produce by hap-hazard, worlds and all things in them, which neither Men nor Angels can effect by their wisdom. 13. If the statue or picture of a man cannot be effected, but by art, reason, & wisdom, what impudency is it, saith *Lactantius*, to affirm man himselfe by chance to be made, or by a temerarious and fortuitall conglobation of atomes. 14. We see the World and the creatures therein governed, not temerariouly, but by an admirable providence and wisdom, how then can any imagine these should be made by chance, and not by wisdom. 15. I would know whether Towns, Castles, Temples, Ships, & other buildings, are made up of atomes? If these are not, how shall we believe that celestiaall or sublunary bodies, or the whole World should be made of them. 16. When *Epicurus* gives to his atomes magnitude, figure and weight, hee makes them perfect bodies, and consequently unapt for Physicall mixtion: For the uniting of perfect bodies makes up an aggregative body; so that in the generation of bodies there is no mixtion but aggregation, which is ridiculous. 17. Hee gives figures to his atomes, and yet makes them invisible, which is a plain Bull and contradiction: For an invisible figure is like an invisible colour, an inaudible sound, an inodorable smell, an unguistible sapor, an untangible hardnesse. To make the senses proper objects insensible, is a senselesse toy. 18. He makes his atomes move downward in a straight line, by reason of their gravity; but fearing lest by this motion there would never be any concurring of them for generation, he assigns them in another motion, which he calls declination, and so to one simple invisible indivisible body, he gives two motions, but tells us not the cause of this motion of declination, which as *Tully* saith, argues his grosse ignorance in Natural Philosophy: For I would know whether this motion be from an internal or external cause; not from an internal, for there is no other internal cause of the atomes motion downward, but gravity, which cannot produce two motions; the cause cannot be external, because *Epicurus* his Gods doe not move or work at all: Beside that, his Gods are also made of atomes, as *Cicero* shews. 19. Most ridiculouly did he invent this motion of Declination, lest he should seem to deprive man of his liberty of will: For



For he thought mans will must needs be necessitated, if those atomes of which the soul is made, should have no other motion but downward, which is a naturall and necessary motion. And by the same means also he took away Fate or providence. Thus have I briefly touched the absurdities of this opinion, which is so hugged, and greedily swallowed without chewing, by some unsetled and vain-glorious men, nor regarding the dangerous consequences arising thence, not the impiety of the Authour, being both an Atheist and a prophane wanton, and unsetled in his opinions, saying and unsaying at his pleasure: For when he saw the envie and danger he had brought upon himselfe by his impious Dictates, he sweetens them a little in effect, as *Tully* saith, denying all Divinity, and yet in words allowing Divine Worship, which is most ridiculous: to pray and praise, to feare and love, to serve and worship such Gods as neither love nor hate us, such as take no notice of our good and evill, such as have no relation to us, nor we to them. So he palliates sometimes his swinish pleasures with the delights of the mind, clothing a foul Strumpet with the habit of a modest Matron; whereas by the delight of the minde, he meant nothing else but mentall thoughts, or the delightfull remembrance of his fleshly pleasures, which we leave to him and his Disciples, *Epicuri de grege porcis.*

## CHAP. XVIII.

1. That Chrystal is of water, proved, and the contrary objections answered how it differs from Ice. 2. The Loadstone moves not; its Antipathy with Garlick. Of the Adamant, Versoria, Amber, &c.

**T**Hat Crystall was at first Water, then Ice, and at last by extreame cold hardned into a stone, was the opinion of the ancient Philosophers, and of *Scaliger* the best of the Modern; but *Mathiolus*, *Cardan*, *Boëtius de Boëte*, and *Agricola*, with some others, will have it to be a Minerall body, hardned not by cold, but by heat, or a Minerall spirit. Of this opinion is the Doctor (*Book 1. Cap. .*) both his reasons are not satisfactory: For first (saith he) *Minerall spirits resist congelation, but Ice is water congealed by cold.* Answ. He takes this for granted



granted which is not : For he is to prove Crystal a mineral, and that 'tis hardned by a mineral spirit, which he doth not. Again, all Minerals resist not congelation, but further it sometimes as he sheweth himselfe of Snow and Salt by the fire side turned into Ice, and of water converted into Ice, by Salt-peter. Besides, all minerals are not hard, for Quicksilver is not, nor can mineral spirits harden their own bodies or keep them from dissolving into liquor, it is the external heat or cold that doth it, not the internal spirit, as we see in Salt, which dissolves into water if it be not hardned by the heat of Sun or fire, and so will Ice dissolve into water, if the cold grow remiss or the heat prevaile. If then a Mineral spirit cannot harden its own body, how can it harden the body of water? What mineral spirits are there in cold water to harden it into Ice? Spirits are hot, therefore apter to dissolve water then harden it; but we see manifestly that it is cold and not spirits which causeth Ice: the same cold in some Caves where the Sun never comes, nor heat, converteth water-drops into stones and the cold of some waters metamorphise stickes, leaves and trees, pieces of lether, nut-shells, and such like stufte into stones; why then may not cold convert Ice into a higher degree of hardnesse, and prepare it for reception of a new forme, which gives it the essence and name of Crystal. 2. [A liquation in Crystal may be effected, but not without some difficulty; but Ice may dissolve in any way of heat.] *Answ.* The difficult melting of the one, and easie liquation of the other, wil not prove that Crystal was not Ice, but that it is not ice. For as Scaliger saith, *Valde à seipso differt quod fit, dum fit, & cum est*, Ice before it attains the hardnesse of a stone, or Crystal, is yet water formally, and Crystal onely materially, or in the way of preparation. But when it ceaseth to be ice, it assumes the form of crystal, and wil not deny its original, that it was once Ice, which now is a stone. The matter then of crystal, is water, and it is made of Ice, because it was water, by which Ice it hath stept up to the forme of a stone. 3. *They are differenced by supernatation, or floating upon water, for crystal will sink, but ice will swim in water.* *Answ.* Its no wonder to see a stone sink, and ice swim; for crystal when it was ice, swimm'd, being now a stone, sinks; as being a body more compact, hard, solid, and ponderous: so a stick will swim, but when it is converted to a stone, it sinks. The argument therefore is good thus: Crystal sinks, Ice swims, therefore crystal is not ice; but it will not follow, therefore crystal was not ice.

4. *They*



4. They are distinguished in substance of parts, and the accidents thereof, that is, in colour and figure, for ice is a similiary body, but the body of crystal is mixed, and containeth in it sulphure, for being struck with steel, it sends forth sparks, which are not caused by collision of two hard bodies, but they are inflamable effluences discharged from the bodies collided; for a steel and flint being both met, will not readily strike fire. *Ans.* Crystal is not so much distinguished either in substance or accidents, from ice, as a chick is from an egge, and yet the chick was an egg.

What wonder is it, if crystal having received a new form, be distinguished from ice, whereas we see greater distinctions daily in our own nutrition, our blood, flesh, and bones, have neither the colour, figure, or substance of corn, fruits, hearbs, roots, and other meats we feed upon. In the same rose-leaf there be distinct qualities and operations, one part being restraining, the other laxative; the same Rhubarb as it is differently prepared, differently worketh, one way by loosning, another way by binding the belly. Let us not deny that distinction to a natural, which we give to an artificial preparation; there are distinct colours in one and the same leaf of a gillyflower, or tulip. Again, when he saith, *That Ice is a similiary body, but Crystal is mixed*; Here is no opposition, for similiary and dissimiliary, are opposite, not similiary and mixed, for a similiary body may be mixed; so is flesh, so is blood, so is ice, except he will make it a pure element. And when he saith, *Crystal containeth sulphure in it*; This is very unlikely, for sulphure is hot and inflamable, it is also viscous and fat, it is of a piercing quality and of an ungrateful smel, none of which qualities we finde in crystal. In fiery mountains there is most sulphure, in snowy mountains, most crystal; but his reason to prove there is sulphure in crystal, is invalid, because saith he, *being struck with steel, it sends forth sparks*; by this reason he may prove there is sulphure in every hard thing, even in wood and sticks, for by attrition, or any other violent motion, they are inflamable, as the Americans know, who use no other way to kindle their fires, but the attrition of sticks. Arrows will burn in the air, their Lead will melt, bells, mil-stones, and cart-wheels, will grow extream hot with motion, and so wil water; is there sulphure in all these? And here he contradicts himself, when he saith, *That the Sparks are not sent forth by collision of two hard bodies, but they are inflamable effluences discharged from the bodies collided*. I would know how these effluences can



can be discharged, if the bodies be not collided, and how they can bee collided without collision. These sparks then are doubtlesse the accension of the aire, and aerial parts of these hard bodies, by motion and collision, being no way hindered by wetting the Steele and Flint, for I have tried the contrary by wetting both, and yet the Sparks fly out as readily, as if both had been dried; so they will out of Flints taken out of Rivers, where they have been perpetually moist, so that the sparks are not quenched at their eruption, because the air is not wet, though the Steele and Flint be.

5. *They are (saith he) differenced in the places of their generation; For Crystall is found in Regions where Ice is seldom seen* Answ. It is sufficient that in those Regions where Crystall is found, Ice is sometimes seen; and as Ice is there but seldom seen, so Crystall is there but seldom found: The best and greatest quantities are found in cold and snowy Countries. Again, though in those hotter Countries the air above is warm, yet in the bowels of the earth it is as cold, or rather colder, then elsewhere by antiperistasis; and that is sufficient to prove Crystall may be there generated.

6. *They have contrary qualities elementall, and uses medicinall.* Answ. It is true, Ice is moist, and Crystall dry: so water is moist, and salt is dry; will it therefore follow, that salt is not generated of water? Allum, Salt-peter, Vitriol, are all hard and dry, so are the bones in our flesh, the teeth in our gums, the stones in fruits, yet all are begot of soft and moist materials. As for their contrary medicinall uses, I question not, whereas there are in one and the same simple (as I shewed but now) contrary effects.

II. In the 2, 3, and 4 Chapters of the second book, the Doctor hath divers pretty and pleasant Discourses of the Loadstone and Amber, yet to some passages I cannot assent; as 1. when he saith, *There is coition, syndrome, and concourse of the Loadstone and Iron to each other*; For I doe not think that the stone is moved at all to the Iron, for every naturall motion hath its reason and end; the end of attraction in animals and vegetables is for aliment; the motion of stones and other heavy bodies downward, is to enjoy their Matrix, or Center: but no end can be assigned why the Loadstone should draw or move towards the Iron: the motion therefore is in the Iron, and other metals, which are moved to the Loadstone, as to their Matrix, saith Scaliger; therefore it is no more wonder for Iron to move to the Loadstone, then to move downwards, the end and efficient cause being the same in both motions, to wit,



wit, the enjoyment of their proper place or matrix. 2. Whereas the ancients held that garlick hindred the attraction of the Loadstone, he contradicts this by experience ; but I cannot think the ancient Sages would write so confidently of that which they had no experience ; of, being a thing so obvious and easie to try ; therefore I suppose they had a stronger kind of garlick, then is with us, which made *Horace* write so invectively against it, calling it poison and worse then hemlock. 3. He denies the vertue of the Adamant in hindring the Loadstones attraction, which the Ancients affirm. It seems our diamonds have not this vertue, but this is no sufficient reason to deny the vertue of the Adamant, for though our diamond be a kind of Adamant, yet it is not that kind which the Ancients speak of ; for *Pliny* reckoneth six kinds of Adamants. 4. He takes *Versoria* in *Plautus*, with *Turnebus*, for the rope that turns about the ship ; but if *versoria* there signifies a rope, it must be false Latine, for *funis* must be understood, therefore *Plautus* would rather have said *versorium* ; but I rather take it with *Joseph Scaliger*, upon *Manilius*, and with *Pineda*, for a turning back and taking the contrary way : so that it is an adjective, and *via* is to be understood ; the same phrase *Plautus* useth in *Trinummi*, when *Stasimus* bids *Charmides* return to his master, *cape versoriam recipe te ad herum* ; or else *versoria* is taken for the helm by which the ship is turned about. 5. He will not have amber a vegetable, but a mineral concretion, as is delivered by *Boetius*. *Answ.* *Boetius* delivers, that there are three sorts of Amber, to wit, minerals, animals, and vegetables, the first is begot of a bituminous exhalation or oil ; the second of the fat of animals, the third of the gum of trees ; he tels us also that because oftentimes in Amber are found spiders, flies, and other insects, with pieces of sticks and straws, which the gum falling from the trees, might lick up, or involve. That all Amber is vegetable, and the juice of trees, even that which is gathered in the sea, because saith he, much land hath been drowned by the sea, and gained from the sea again, as he shews of the *Netherlands*. *Cardan* denies not but all Amber is the juice of trees, yet made bituminous by the heat of the sea ; and *Sal-muth* upon *Pancerol*, tels us, that the Ancients called that only Amber, which distilled from the trees, whence *Saint Ambrose* calls it the tears of the shrub ; therefore though it be thickned by heat or cold, or the sea-water, it is not therefore to be called



led a Minerall, but a Vegetable, as having its originall and essence from Vegetables. Scaliger writes, That there is a kind of black Amber gathered in those Seas where there is greatest store of Whales; and therefore Amber is called Whale by the inhabitants of *Morocco* and *Fez*, as believing that it is a substance proceeding from the Whale: But whether it be true Amber, may be doubted, and I do not find that among the Ancients *Succinum* signified any thing else, but the Gum of Trees, concreting into a solid substance, and of this kind is *Petrus Bello-*  
*nus*, in his Observations.

CHAP. XIX.

1. The Navigation of the Ancients by the stars: they knew not the compass.
2. Goats blood softneth the Adamant. Gold loseth its vertue and gravity with its substance. Iron may grow hot with motion. Coral is soft under water, and hardened by the air. Viscum or Mistletoe, how it grows. The shade of the Ash-tree, pernicious to Serpents.

IT is not probable (saith the Doctor) That the long and sundry voyages of elder times, were performed by the help of Starres. It is so farre from being improbable, that there was a necessity they should be directed by the Starres, wanting the use of the Compasse; therefore *Palinurus* in the Prince of Poets, is still described observing the starres in his Navigation, *Sydera cuncta notat tacito labentia cælo*, *Æneid.* 3. And, *Oculosque sub astra tenebat*, *Æneid.* 5. And in his *Georgicks*, he sheweth, That the Sea-men were the first that made use of the starres, and gave them names, *Novita tum stellis numeros & nomina fecit*, *Pleiades*, *Hiados*, *clarumque Lycaonis Arcton*. So *Seneca* sheweth, That before Navigation, there was no use of Astronomy, *Nondum quisquam sidera norat*. And *Flaccus* tells us, That *Typhis* directed his course altogether by the starres. *Pervigil Arcadeo Typhis pendebat ab astro: Agniades Fœlix stellis qui segnibus usus*. So *Horace* wisheth, That *Venus*, *Castor*, and *Pollux*, those cleare starres, might direct the ship in which *Virgil* was, *Sic te diva potens Cyprî, &c.* The lesser Beare, called *Arctophylax* by the Grecians, and *Cynosura*, or dogs tail; and by some *Phœnice*, was altogether observed by the *Sidonians*, or *Phœnicians*, the first  
and



and chiefest Navigators we read of, the greater hare called Helice; directed the *Gracians* in their Navigation. The grounds and rudiments of this art was first laid by *Noah*, afterward his posterity perfected it by industry and observation, marking how fishes did swim, and birds flie, ruling their motion with their tails, and furthering it with their wings and finns, whence we have the use of Helms and Oars, or sails; therefore in Hebrew *trium* signifieth both a bird and ship, and in Latin *n* put to *ruis*, makes *navis*. The perfection of this art is now in this last age attained to by means of the compass, unknown to the Ancients whose Navigation was along the Coast, as we know by the voiajes of *Aneas* and *Paul*, who for want of the compass durst not venture into the Ocean, as we do. In the voiage of *Jonas*, and others, we find they used Oars most commonly; by the Navigation of *Paul*, we learn that sounding the coast was much used; yet we read that the Ancients sailed in the Ocean: but by this word we must understand the Mediteranean sea, called by the Psalmist the great and wide sea, and by *Virgil*, *mare magnum*, *Æn. 5.* or else the skirts and brim of the Ocean; for they knew no other Navigation, then along the coast, as we see by the voiage of *Hanno*, from *Calez* to *Arabia*, and of *Eudoxus* from the bay of *Arabia* to *Calez*, and the Fleet of *Augustus* which sailed Northward; for they neither durst, nor could with safety venture too far into the Ocean, without the compasse, the want of which, made *Solomons* ships spend three years in their voiage, which might have been effected in three moneths; they entred also into most Creeks and Harbors by the way, to finde out rarities for *Solomon*. This admirable sea-guide was found out by one *Flavius* at *Melphis*, in the kingdome of *Naples*, above three hundred years ago, as *Blondus*, *Panceros*, and others affirm. *Pliny* speaketh of the *Magnes*, or loadstone, but makes no mention of this vertue to turn the iron touched therewith to the pole, nor in reciting the instruments of Navigation, doth he speak a word of this. In no ancient Writer do we find this vertue mentioned, nor so much as a name for it in Hebrew, Greek, or Latin, neither do they mention the touching of their sun-dials with it; besides, *Pliny* saith, the Islanders of *Tayroban* or *Sumatra*, because they cannot see the North, carry with them in their ships certain small birds, which being let loose, by naturall instinct fly to the Land, whether the Mariners direct their course after these guides; this sheweth they were ignorant of the compass, as *Acosta*, *Gomara*, *Pance-*



*Pancerol, Salmuth*, and others do prove. The *Phœnicians* and *Sidonians* were anciently the expertest Navigators of the world, yet we find not that they had any knowledge of the compass: the *Carthagineans* indeed by sea viewed all the coast of *Mauritania*, yet they kept close by the shore; and though ingenious men did live in old times, and were inventors of many rarities, yet some things they have left for posterity to finde, whereof they were ignorant, as Clocks, Guns, Printing, &c. therefore the reasons of *Lemnius* are weak, who thinks the Ancients knew the compass, and no less infirm is the argument of *Pineda*, taken from *Solomons* knowledge of all things; for this word (*all*) in Scripture, is taken for many, and many is taken for all: So Christ cured all diseases, in *S. Matthew*, that is, many; so all of those that sleep in the dust of the earth, saith *Daniel*, shall arise, that is, many. *Solomon* then knew all things, that is, most things and more then other men; but I do not think he knew the compasse or all the species of animals, vegetables, minerals, people and places, that are found at this day in *America*, nor all the arts invented since, nor all the supernaturall works of God. His chief knowledge was politicall, for government; he knew not the future contingencies, nor all the secrets in the earth and seas; if he knew the polar verticity of the Loadstone, then *Adam* also knew it, for his knowledge far exceeded *Solomons*, he gave names to all the creatures according to their natures; he lived 930. years, a fair time to get experience; yet though *Adam* knew this, it will not follow that the compass was used in his time, or in *Solomons* either, who knew that Copper and Brass did sound well, yet Bells of Copper were not used in his time; and whereas *Pineda* saith, that God would not have so useful a thing as the compass, hid from man so long. I answer, that Printing is no less useful, which was not known till of late. What was more usefull then the Preaching of the Gospel, and Incarnation of Christ, and yet hid many thousand years from the world? God hath his own times to bestow his gifts on men; for that fable of ships built without iron, for fear they should be staied in the sailing by the great store of Loadstones neer *Calicut*, is ridiculous; for our *European* ships are continually trafficking that way, and they perceive no such things. To conclude then, ships of old were guided, being out of sight of Land, not by the compasse, but partly by the Tides, partly by the Windes, and partly by the Stars, and Sea-birds; and when all these failed, they wandred



up and down, not knowing where they were, as we see in *Æneas* his Navigation, *cæcis erramus in undis, nec meminisse viæ media Palinurus in unda*; the like we may read in Saint *Paul*'s voyage.

II. The Ancients held that Goats blood could soften the Adamant, and yet resist the hardest hammers; this is denied by the Doctor (2 Book c. 5, 6, 7.) and his Lapidaries: but their argument is not Logical; our Diamonds are not softened by Goats blood, but are mastered by hammers; therefore the Ancients Adamants were such. All Adamants are not of the same kind, for *Pliny* as we have already said, reckoneth six sorts of them; and I think it is no greater wonder for blood to soften a stone, then for water to harden a piece of Leather, or a stick into a stone. 2. He saith, [that though the substance of Gold be not sensibly immuted, or its gravity at all decreased, yet from thence vertue may proceed; for a body may emit vertue without abatement of weight, as is evident in the Loadstone.] *Ans.* An accident without a miracle, if it be the same numerically, cannot pass without the substance in which it is inherent, nor can the substance be diminished but the gravity must also be abated. Therefore if Gold in the Patients body loseth nothing of its substance and gravity, it loseth no part of its vertue: if the loss be insensible, the vertue communicated to the patient is insensible also; and so he that swallows gold receives no good by it: For where there is a cure, there must be a sense and feeling of the cure. As for the Loadstone, if it imparts its vertue, it parts also with its substance, but in so small a quantity that its scarce perceptible; but the gold ought to impart much vertue to cure the disease, and consequently much of its substance, which would be seen by the weight and the cure; but neither is sensible, and therefore no deperdition, but imaginary. 3. He cannot apprehend how an iron should grow red hot by motion, since in swinging a red hot iron, it wil grow cold. *Ans.* That violent motions will excite heat and fire in hard bodies, we have already shewed in divers examples; *Aristotle* proves it by the example of Arrows, whose Lead will melt with the heat and motion thereof, in that part of the air, which is near the fire (de cælo, l. 2. c. 7.) *Virgil* confirms the same, speaking of that Arrow which *Acestes* shot, that it took fire in the motion. *Namque volans liquidis in nubibus arsit arundo, signavitque viam flammis, Æn. 5.* but when he saith that hot iron will grow cold by swinging, I grant it, because that heat in the iron is meerly accidental, and from



an external principle, it wants pabulous aliment in the iron to maintain it; therefore no wonder, if encountering with the cold air, it extinguish: but take a bran or stick of fire, and swing it about, it will grow redder, hotter, and more fiery, because there is not the bare accident of heat; but the substance of fire, which is animated and quickned by the motion of the air; neither is it strange if the violent motion of an Arrow in hot weather, and in that part of the aire which is neer the fiery element, take fire, where we see so many fiery Meteors ingendred. But he saith, that a bullet shot at paper or linen, will not set them on fire; it may be so, because the bullet is not hot enough, having moved but a little way, and a small time; you cannot in a long time make paper or linen burn, be the fire never so hot, except they touch the flame. 4. He will not believe that Coral is soft under water, and hard in the air, because one who went down a hundred fathom into the sea, returned with Coral in each hand, affirming it was as hard at the bottom, as in the air. Answ. Boetius in his second Book of stones and gems, c. 153. tells us, that Coral doth not harden or grow stony till it be dead; it seems then, whilst it is alive, its soft under water, and therefore this Diver lighted upon a dead Coral; but because that was hard, it will not follow that all Coral under water is hard, except all under water be dead. There is also a difference between old and young plants, the older the plant grows, the harder it is; perhaps this was not only dead but also an old plant: Its no wonder then if Coral petrifie when taken out of the sea, for then it dieth being separated from its matrix and element, in which it had life and vegetation; and it seems by the same Boetius, that the substance of Coral at first is wood, for he saw some which was partly wood and partly stone, not being thoroughly petrified, which might proceed from some internal impediment: it is therefore no more wonder for a sea-plant to petrifie in the air, then for a land-plant to petrifie in the sea, or other waters. This is called in Greek *λίθος δένδρον*, as you would say ston-tree, or stone-plant, and *κωργάλιον*, quasi *χερσάλιον*, because it petrifieth when it is touched by the hands, and because the Gorgons were turned into stones, therefore in Pliny, Coral is called *Gorgonia*. 5. He likes not the opinion of the Ancients, concerning the generation of Viscum or Mistletoe, to wit, that it is bred upon trees from seeds let fall there by thrushes, and ring-doves; his reasons are, because it grows only upon some trees, and not in Ferrara, where these birds are found, and because the seed thereof being sown, it



will not grow again, and in some trees it groweth downwards under the boughs, where seed cannot remain. *Answ.* That Viscum is begot of seeds let fall by birds, as the Ancients thought, may be true, and that it is an excrescence of viscous or superfluous sap, as *Scaliger* writes, may be true also. Many things are procreated both with and without seeds; there is an equivocal generation both in vegetables and animals, which the learned Poet knew when he writ of this Viscum, saying, *Solet fronde vivere nova quod non sua seminat arbor.* Now the reason why it groweth not upon all trees, and in all Countries, is, because as the same Poet saith, *Non omnia fert omnia tellus*, there is not a disposition in the matter of all trees to receive this form, nor in the climate or soile to animate this seed. Yet *Mathiolus* observes, that in *Heiruria*, where is greatest store of Thrushes, there is greatest plenty of Mistletoe, which shews, that this plant hath its originall from the seeds mixed with the excrements of those birds; and therefore the old proverb was not untrue, *Turdus sibi malum cacat*, even in the literall sense; and so where this Viscum is meerly an excrescence, it may grow downwards under boughes, where no seeds can come or remain. 6. He can deny that a Snake will not endure the shade of an Ash; *Pliny* and other ancients affirm it, perhaps upon surer grounds then the Doctor denies it; for though here in these cold Countries our Snakes may accord with our Ashes, yet it may be otherwise in hot Regions, where the Serpents are more venomous, and the Ash-leaves more powerfull: why may there not be somewhat in the shade of an Ash repugnant to the Serpent, whereas the leaves and juice thereof are such Antidotes against poyson, as *Dioscorides* and *Mathiolus* shew? *Cardan* tells us, That in *Sardinia* the shadow of the *Rododaphne* is pernicious to those that sleep under it, making them mad. He instanceth the dangerous qualities proceeding from the shadowes of some other trees; and *Lucretius* affirms, That the shade of some other trees procure pains in the head, and other dangerous effects.

*Arboribus primum certus gravis umbra tributa est  
Usque adeo capitis faciant ut saepe dolores,  
Si quis eas subter jacuit prostratus in herbis.*



CHAP. XX.

What the Ancients have written of Griffins may be true. Griffins mentioned in Scripture. Grypi and Gryphes, Perez and Ossifrage, what?

THE Doctor [denies there be Griffins, that is, dubious animals in the fore part resembling an Eagle, and behind a Lion, with erected ears, foure feet, and a long tail, being averred by *Ælian*, *Solinus*, *Mela*, and *Herodotus*,] *Answe.* *Ælian* tells us, That Griffins are like Lions in their pawes and feet, and like Eagles in their wings and head. *Solinus* saith onely, that they are very fierce fowls; *Mela*, that they are cruell and stubborn animals; *Herodotus* onely mentions their names, when hee shewes the *Arimaspi* takes away their gold from them: So *Philostrates* shewes, That in strength and bignesse they are like Lions; So *Pausanius* speaks of them; but neither he, nor the others named, tell us in plain terms, that they are like Lions behind, and Eagles in the fore-part: For *Pliny* and some others doubt of this as fabulous. 2. Suppose they had thus described Griffins, as mixt and dubious animals, yet this is not sufficient to prove them fabulous: for divers such animals there are in the World. *Acosta* tells us of the Indian *Pacos*, which in some parts thereof resemble the Asse, in others the Sheep. *Lerius* speakes of the *Tapiroussou* in *Brasil*, which resembles both an Asse and an Heifer. Many other sorts of mixt animals we read of, as flying Cats, and flying Fishes; and some kind of Apes with Dogges heads, therefore called *Cynocephali*. Our Bats are partly birds and partly beasts: They flye like a bird with two feet, they walk like a beast with four: They flye with their feet and walk with their wings, saith *Scaliger*. And which is a greater wonder, there are Plant-animals, or Zoophits, partly plants, and partly animals. But he saith, In Bats and such mixed animals, there is a commixtion of both in the whole, rather then an adaptation of the one into the other. Here he is deceived; for in Bats and such like Animals, it is easily seen what parts are of the bird, what of the beast, which we could not discern if there were a commixtion: it is rather an adaptation then. This is most apparant in that Indian beast which hath the forepart of a Fox, the hinder part of an Ape, the eares of an Owl, and a bag or purse under its belly, wherein its young ones hide themselves in time of danger. Neither is it fabulous that these Griffins are greedy of gold, which



which they preserve & hide in the earth : for I have seen Magpies doe the like : I have observed one which stole money, and hid it in a hole ; and perhaps it may be from this that *Plautus* calls Griffins Magpies ; *Picos divitiis qui colunt aureos montes supero. In Aulul.* And yet I am of *Ælians* opinion, That it is not so much for the gold they fight, as for their young ones, which men use to carry away vvhhen they search the Countrey for gold. Neither was *Aristaus* the first that affirmed these Griffins, as the Doctor saith ; for we read of them in *Leviticus* and *Deuteronomy*, which though *Tremellius* and wee use not, but the word *Ossifrage*, yet the Hebrew word *Peres* is translated Griffi by the Septuagints, by the old Latin, by *Jerom* and *Pagmin*, by *Arias Montanus*, and by the Italian version : And if  $\square\gamma\zeta$  be from  $\square\gamma\delta$  to break, then may the word *Ossifrage* be meant of the Griffin : for no bird so fit to break bones, as this fierce and strong animall.  $\gamma\epsilon\upsilon\delta$  then signifieth properly a Griffin, and not a kind of Eagle with a hooked Bill ; for both birds with hooked Bills, and men with Aquilan noses, are called *Gryphi*, not *Gryphes*. Hence then it appeares, that the negative testimony of *Michovius* is not sufficient to overthrow the received opinion of the Ancients concerning Griffins, especially seeing there is a possibility in nature for such a compounded animall. For the *Gyrassa*, or *Camelopardalis*, is of a stranger composition, being made of the Libbard, Buffe, Hart, and Camell. Besides, though some fabulous narrations may be added to the story of the Griffins, as of the one-ey'd *Arimaspi* with whom they fight, yet it follows not that therefore there are no Griffins. If any man say, That now such animals are not to be seen ; I answer, It may be so, and yet not perished : for they may be removed to places of more remotenesse and security, and inaccessible to men : for many such places there are in the great and vast Countries of *Scythia*, and *Tartaria*, or *Cathaya*, vvhither our Europeans durst never, nor could venture.



CHAP. XXI.

1. The existence of the Phoenix proved by divers reasons: and the contrary objections refelled: the strange generation of some birds.
2. The Ancients cleared concerning the Phoenix, and whether the Phoenix be mentioned in Scripture. Divers sorts of generation in divers creatures. The Conclusion, with an Admonition not to sleight the Ancients opinion and Doctrine.

BECAUSE the Doctor following the opinion of *Pererius*, *Fernandus de Cordova*, *Francius*, and some others, absolutely denies the existence of the Phoenix, I will in some few positions set down my opinion concerning this bird. 1. I grant that some passages concerning this bird are fabulous; as that he is seen but once in 500 years, that there is but one onely in the World; or if there be two, that the old Phoenix is buried by the younger at *Heliopolis*. 2. These fabulous narrations doe not prove there is no such bird, no more then the fables that are written of *Saint Francis*, prove that there was never any such man. 3. Nor doth it follow, that there is no such bird, because some write, they never read of any who had seen a Phoenix; for though these few vvho vvrite of this bird, did never see him in a picture, yet the Egyptians, from whom they had the knowledge of the Phoenix, did see him. *Tacitus* writes, That no man doubts but that this bird is sometime seen in Egypt, *Aspici aliquando in Aegypto hanc volucrem non ambigitur*, Ann. l. 6. There are some creatures in *Africa* and the *Indies*, that were never seen by any of those who writ their histories, the knowledge whereof they have onely by relation from the inhabitants. 4. Though Egypt vvvas the mother of many fictions, as *Pererius* sheweth, yet it vvill not follow that the Phoenix is a fiction, or that Egypt vvvas not also the School of many truths; for the Græcians from thence had the their knowledge and vvifdom, *Orpheus*, *Homer*, *Museus*, the Poets; *Lycurgus*, and *Solon*, their Law-givers; *Plato* & *Pythagoras*, their Philosophers; *Eudoxus* and other Mathematicians, were all Scholars in Egypt. 5. That there is but one Phoenix, is not against Philosophy and Logick, which teacheth us, That the species can be preserved in one Individuall, *Pererius* sheweth, That this is only true in things incorruptible, as in the Sun and Moon; but I say, That this is true also in things subject to corruption; for in these, though the individuals be corruptible, yet the species are eternal;



ternall; and it skills not how few the particulars be, so long as the species can be preserved in one; and though there be no individuall actually existent, yet the species can be preserved; for in Winter the species of Roses is not perished, though there be no individuall Roses actually existent; for even then they have their being and essence, though their existence be but potentially in the ashes, as the forms of the elements are in the mixed bodies, or as the form of a cock is in the egg, which by the heat of the hen or Sun, is actually educed. 6. Whereas *Pererius* holdeth it inconvenient, that so noble a species as the Phoenix is, should have but one individual, subject to so many dangers; I answer, That in all beasts and birds, the nobler the species is, the fewer are the individuals; there are not so many Eagles as Doves, nor Elephants as Rabbits, and Nature is so provident in the conservation of the species, that vvhhere there be few of the kind, they live long, and have their abode in some remote rocks, mountains, Islands and Desarts, from the dangers they are subject to by men, as Eagles, and the Phoenix, which is seen but seldom. Now multitude of individuals doth not argue the nobility of the species, but rather imperfection; for it proceeds from the division of the matter, whereas unity noteth perfection, as issuing from the act and form of things. 7. Whereas *Fernander* sheweth, it's a miracle that the Phoenix can never be taken dead or alive; I answer, It is a miracle in nature, and we know there be many naturall secrets and miracles: is it not a miracle that the *Manucodiata*, or bird of Paradise, is found dead sometimes, but was never seen alive, neither was there ever any meat or excrement found in his belly? how he should be fed, where his abode is, from whence he cometh (for his body is found sometime on the sea, sometime on the land) no man knows: the Phoenix is sometime seen alive, but seldom, because provident Nature hath given him that instinct for the preservation of his kind, that he appears to man, the great tyrant over the creatures, but seldom; for had *Heliogabalus*, that Roman Glutton, met with him, hee had devoured him, though there were no more in the world. Nature hath given to each creature so much policie, as to preserve themselves from danger; and the fewer there be of that kind, the more wary and cautelous they are; and if it be true that *Pliny* and others write of the Ravens, that their nests can never be found, it is a great miracle, which perhaps may be so in *Italy*; yet in the rocks of *Norway*, *Shetland*, and other Northern places, their Nests are found. But it is more to be admired,



admired, that Ravens use to flye to the places where dead bodies are, and by a strange instinct have knowledge of the bodies dying two dayes before they be dead; and I think there is as great a miracle in the Loadstone, as there is in the Phoenix. 8. It is as possible for a Phoenix to arise out of the ashes of the dead parent, as for a silk-worm to proceed out of the Egge of the dead Worm. If any reply, That the one is perfect, the other imperfect; I answer, That every thing is perfect in its own kind, and in generation; Nature looks not at the perfection or imperfection of the creature, but to the aptitude and disposition of the matter to receive such a form, Again, a Cock, which is a perfect creature, is excluded out of the Egge by the heat of the Sun, or Fire; and Scaliger speaks of a bird that was found in a shell, the learned men of that time concluded, That the Oyster was turned into a bird. I take it to be as great a wonder for a Mule, which is a perfecter creature then a bird, to be generated of the seed of another kind, then that the Phoenix should arise out of the putrified ashes; That the Clakgeese are generated of trees in the North-seas, beyond Scotland, is not altogether fabulous; the inhabitants thereabout at this day constantly believe it. They are observed every year to flye from the North to Shetland and Orkney, where I have been; in the beginning of Winter they come thither, in the Spring they flye away Northward in flocks, which must be to Norway or Greenland, for I know no other land they can repair to Northward. Island is Northwest, but neither in these places, nor any where else, could their nests be ever yet found. Besides, bodies of old trees that have been driven upon these Islands by the winds, have had upon them the full proportion and shape of those birds. And why should this be more incredible then that which Scaliger writes of a certain tree in the river Juverna, whose leaves falling into the water, receive the form & shape of fishes, and life withall; and of that tree in the Isle Cimbulon, whose leaves falling on the ground, move themselves backward & forward; being touched, they go back: one of these was kept 8 dayes alive in a platter. 9. Whereas Fernandus asketh, whether every parcell of the dead Phoenix his ashes hath an aptitude to become a new Phoenix; if it hath, then (saith hee) there is more then one Phoenix; if it have not, what is the reason that one part of these ashes should have this aptitude, and not the other; I answer, All that heap of ashes is but one body, of which is produced one Phoenix, as one bird out of



of one egge, and not many out of the severall parts thereof. 10. Though *Aristotle* and some others make no mention of the *Phoenix*, it will not follow that therefore there is no such bird extant; for there are many kinds of creatures of which they write not. 11. It is likely that the bird *Semenda* in the *Indies*, vvhich burneth her self to ashes, out of which springs another bird of the same kind, is the very same with the old *Phoenix*. 12. The testimony of so many Writers, especially of the Fathers, proving by the *Phoenix* the Incarnation of Christ, and his Resurrection, and withall our resuscitation in the last day; doe induce me to believe there is such a bird, else their Arguments had been of small validity among the Gentiles, if they had not believed there was such a bird. What wonder is it, saith *Tertullian*, for a virgin to conceive, when the Eastern bird is generated without copulation, *Peribunt homines, avibus Arabia de resurrectione sua securis*. Shall men utterly perish (saith he) and the birds of *Arabia* be sure of their resurrection? The existence of this bird is asserted by *Herodotus*, *Seneca*, *Mela*, *Tacitus*, *Pliny*, *Solinus*, *Ælian*, *Lampridius*, *Aur. Victor*, *Laertius*, *Suidas*, and others of the Gentile-Writers. The Christian Doctors who affirm the same, are, *Clemens*, *Romanus*, *Tertullian*, *Eusebius*, *Cyril of Jerusalem*, *Epiphanius*, *Nazianzenus*, *Ambrose*, *Augustine*, *Hierom*, *Lactantius*, and many others.

Now out of what we have spoken, we can easily answer the Doctors objections whic he hath collected out of *Pererius*, *Ferriundes*, *Franzius*, and others; as first, when he saith, That none of those who have written of the *Phoenix*, are ocular describers thereof. Ans. Neither vvas *Aristotle*, *Gesner*, *Aldrovandus*, and others, vvhich have vvrritten largely of beasts, birds, and Fishes ocular vvitnesses of all they vvrote: they are forced to deliver much upon hear-say and tradition: So those that vvrite the later stories of American and Indian animals, never saw all they vvrite of. Secondly when he saith, [That *Herodotus*, *Tacitus*, and *Pliny*, speak so dubiously, that they overthrow the whole relation of the *Phoenix*.] Ans. *Herodotus* doubterh not of the existency of the *Phoenix*, but onely of some circumstances delivered by the *Heliopolitans*, to wit, that the younger *Phoenix* should carry his Father wrapt up in Myrrh, to the Temple of the Sun, and there bury him; so *Tacitus* denieth not the true *Phoenix*, but onely saith, That some hold the *Phoenix* there described, which was seen in the dayes of *Ptolomy* in *Ægypt*, not the right *Phoenix* spoken of by the Ancients. The words of *Pliny* are falsified by the Doctor, who cites them thus:

Sed



*Sed quæ falsa esse nemo dubitabit*: whereas the words are, *Sed quem falsum esse nemo dubitabit*: So that he doth not say, That what is written of the Phoenix is false; but onely that this Phoenix which was brought to Rome in the Consulship of Claudius, was false, and not the right one. 3. He saith, That they who discourse of the Phoenix, deliver themselves diversly, contrarily, or contradictorily. *Answ.* There is no contradiction except it be (*ad idem*) most of them agree in the substance, that there is a Phoenix, they onely differ in the accidents and circumstances of age, colour, and place. We must not deny all simply that is controverted by Writers: for so we might deny most points both in Divinity and Philosophy. 4. He saith the word Phoenix in Job 29. 48. can have no animall signification, because there is expressed *σέλεχον ποινικόν*, the trunk of the Palm-tree; and the Hebrew word is by Tremellius rendred Sand. *Answ.* The same which properly signifieth the trunk of the Palm, may metaphorically be meant of the body of the Phoenix. For the same word in Greek is given both to the Palm and Phoenix; for as the one is long green, so the other is long-lived: but the Hebrew word *חֹמֶל* *hhol* in that place, though expounded Sand by Tremellius, yet signifieth a Phoenix, as both Pagnin, Montanus, Buxtorfius, and other Hebricians affirm; and so doth R. Salomon with other ancient Hebrewes expound this Text of the Phoenix, consonant to which is the Tygurin Version, so Tertullian, Philippus Presbyter, and Cajetan expound this place of the Phoenix, being the symbole of our resurrection, & of a long life. And it seems that the word Phoenix is more consonant to the Text then Sand, because Job speaks of his nest: *I shall die in my nest* (saith he) *and shall multiply my dayes as the Phoenix*. 5. He saith, [That the existence of the Phoenix is repugnant to the Scripture, which affirms; there went of every sort two at the least into the Ark. It infringeth also the benediction of multiplication, Gen. 1. For they cannot be said to multiply who do not transcend an unity.] *Answ.* When the Scripture speaks of two that entred into the Ark of every sort, it means of those that were distinguished into male and female: for the end why these went in by couples, was for procreation, now the Phoenix hath no distinction of Sex, and therefore continueth not his species by copulation, as other creatures do. Hence though he enters into the Ark, it was not needfull he should be named among those that went in by couples and sevens. For how could hee that was but one, be said to goe in two and two, or male and female. As for the benediction of multiplication,



cation, it was not pronounced or enjoyned to the Phoenix, which was not capable of it, God having supplied the want of that with another benediction equivalent, which was a longer life then other animals, and a peculiar way to continue the species without multiplication of the Individuum. 6. He saith, *That to animal generation is required the concurrence of two Sexes, and therefore such as have no distinction of Sex, engender not at all, as Aristotle conceives of Eeles, and testaceous animals.* Ans. Aristotle *de gen. animal. l. 3. c. 10.* shewes that there no distinction of sex in divers Fishes, and Bees, which notwithstanding generate. But when he speaks of Eels in *historia animal*, he shews they do not generate at all, not because they want distinction of sex, as the Doctor saith; for he speaks of divers creatures that generate without that distinction; but because there is not in them *ovovivax*, a production or generation of egges or spawn; for all those kind of Fishes, saith he, which generate, have spawn or egges in them, which Eels want. Again, he shews in his first book *de gener. animal. c. 1.* That sanguine creatures are distinguished into male and female, except a few, saith he: If then there be some sanguine animals without sex, what wonder is it if the Phoenix have none? As for testaceous animals, they want distinction of sex, because they are, as he saith, *Immoveable alone*, and stick to rocks, having as it were the life of plants, and therefore are no other wise distinguished into male and female then plants are, which is not properly but analogically. 7. He argueth, *That if the worm into which the Phoenix is corrupted, becommeth a Phoenix, this would confound the generation of perfect and imperfect animals, and the lawes of Nature.* Again, the generation of venerous animals is not from a corruption of themselves, but rather a seminal and specifical diffusion. Ans. The generation of the Phoenix is no confusion or disturbance of Natures laws, which delights in variety of productions. Therefore in plants we see some produced by their seed, some by their roots without seed; some by their stems onely without root or seeds; some without any of these, immediatly of the earth: So in animals some are generated by coition of male and female in the same kind, as Men, Lions, Horses, &c. Some by coition of different kinds, as Mules; some without coition, by affriction onely, as divers Fishes; some are produced by the female without the male, as the fish *Erythrinus*, which some think to be the Rochet; some by reception of the females organ within the male, as flies; some by a salivious froth, as the shell fishes called the Purple; some are progenerated of slime without coition, out-

wardly



wardly in the mud, as Eels; some without coition, but within the body of the parents, as Bees: And lastly, the Phoenix is begot without coition, of its own putrified body, at which the Doctor wonders how it should be, [seeing the generation of Insects is not by corruption of themselves, but rather a seminall effusion.] To which I answer with *Aristotle*, speaking of Bees, that as they have a proper and peculiar kind of Nature differing from all other creatures, so it was fit they should have *γενεσιν ἰδίαν*, a peculiar and proper kind of production. The like I may of the Phoenix, which is a miracle in nature, both in his his longevity, numericall unity, and way of generation. And in this wonderfull variety the Creator manifests his wisdom, power and glory.

Thus have I briefly and cursorily run over the Doctors elaborate book, *tanquam canis ad Nilum*, having stolln some hours from my universall History, partly to satisfie my self and desires of my friends, and partly to vindicate the ancient Sages from wrong and misconstruction, thing it a part of my duty to honor and defend their reputation, whence originally I have my knowledge, and not with too many in this loose and vvanton age, slight all ancient Doctrines and Principles, hunting after new conceits and whimzies, vvhich though specious to the eye at the first view, yet upon neer inspection and touch, dissolve like the apples of *Sodom* into dust. I pitie to see so many young heads still gaping like Camelions for knowledge, and are never filled, because they feed upon airy and empty phansies, loathing the sound, solid and vvholsome viands of Peripatetick wisdom, they reject *Aristotles* pure fountains, and digge to themselves cisternes that will hold no water; whereas they should stick close and adhere as it were by a matrimoniall conjunction to sound doctrine, they go a whoring as the Scripture speaketh) after their own inventions. Let us not wander then any longer with *Hagar* in the wild desert vvhether there is no water; for the little which is in our pitcher, will be quickly spent; but let us return to our Masters house, there we shal find pure fountains of ancient University learning. Let Prodigals forsake their husks, and leave them to swine, they will find bread enough at home: And as dutifull children let us cover the nakednesse of our Fathers with the Cloke of a favourable Interpretation.

FINIS







A N  
A P P E N D I X  
T O

*Arcana Microcosmi :*

WHEREIN  
Are contained divers Passages ;

As of { Fishes,  
Prefages,  
Sneezing,  
Thunder-struck persons, &c.

W I T H  
A Refutation of divers Tenets held by  
Doctor H A R V I E in his Book

*De Generatione.*

The L O R D B A C O N in his  
*Naturall History,*  
And some others.

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By A E E X A N D E R R O S S.

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L O N D O N,  
Printed by *Thomas Newcomb.* 1652.



A P P E N D I X

TO

Are contained eight Tables

As of  
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WITH

A Relation of the several Years held by  
Doct<sup>r</sup> KAY in his

Dr. C. G. G. G.

The Lord Bacon in his

Y. G. G. G.

And some

By Alexander Ross.

LONDON

Printed by Thomas Newcomb, 1752.





To the Worshipfull and my  
much honored Friend,

*Andrew Henley, Esq;*

S I R,

**I** Should wrong both you, and my  
self, if with Harpocrates, the  
God of Silence, I should lay my  
finger on my lip, and tacitly passe over  
either your Worth and Goodnesse, or my  
obligations and thankfulnessse: Perhaps  
I may trespasse on your modesty, which  
desires no Trumpet to sound before you,  
yet doubtlesse I shall do you right other-  
wise, if I acquaint the world with your  
vertues, and that you are one of that small  
number which in this sordid and phanta-  
sticall Age loves true and solid Learning,  
not being carried away with the vain  
whimzies of brainsick Sciolists, whose  
learning and piety consists in shaking the



## The Epistle Dedicatory.

*foundation of both, esteeming that building strongest which is erected on stubble and straw: but let them alone with their brittle and sandy ground-work, Old Truth is that sure Rock against which Hell gates shall not prevail. I have adventured to consecrate this small piece to you, as one who is truly acquainted and affected with the Old and True principles. In this Dedication I have endeavoured to discharge my selfe of ingratitude and oblivion, and to testifie to the world how much I am indebted to you, which I will alwayes thankfully acknowledge so long as I am*

*Sir,*

*Your humble servant  
to command,*

ALEXANDER ROSS.

AN





## AN APPENDIX.

Containing divers passages of Fishes,  
Presages, Sneezing, Thunder, &c.

With a Refutation of Doctor HARVY,  
the Lord BACON, and others.

### CHAP. I.

1. *Fishes breath not : the Reasons thereof, and the contrary objections answered.* 2. *Fossil or earth-fishes.* 3. *Fishes delight in the light.* 4. *Fishes of Humane shapes.* 5. *Fishes are cunning and docible creatures.* 6. *Why some Fishes have Feet and Wings.* 7. *Many monstrous fishes.*

#### I.

**T**hat Fishes have no breathing, or respiration, is manifest, 1. Because they want Lungs, and other Instruments of breathing: For, though they may receive aire in at the mouth, and let it out again by their gills; yet this is not respiration, which is the action of the Lungs, Wind-pipe, and Diaphragma in attracting the air for refrigeration, and emitting the same. 2. There is no air under or in the water, therefore fishes cannot breath there. For this cause terrestriall creatures die in the waters for want of air, as fishes die in the air for want of water. If any will say, That man dieth in the water, not for want of aire there, but for want of gills, or some other passage to let out the water received into the lungs; I answer, The Dolphin hath a passage, or Fistula,



Fistula to let out the water ; and yet there he could not live without suffocation , if he did not now and then elevate his head above the water to draw breath. If it be again objected , That water is a body mixt with air , therefore Fishes doe breath ; I answer, That so is wine which we drink, mixed with more air then water is ; yet if we did not draw the air above, we should be quickly choked. The quantity of air in the water is so little, that it is discernable by Att onely, not by the senses : and so there is some water in that air which we breath ; yet we are not said to breath water, but air. Again, if there were air in the water which the fishes drew , bubbles would appear upon the superficies thereof, as we see in Mice, or other terrestriall creatures drown'd in the water: For as soon as the water fills the breast and lungs, it draws out the air, which tending upward towards the superficies, causeth bubbles. If it be objected, That fishes breath, and yet make no bubbling, because the air hath a free passage through the gills ; I answer, That the freeness of passage is no hinderance to bubbling, seeing any light agitation of the water will make bubbles, when it hath received air within it , and so we deny not but fishes may make the water bubble , not by their breathing, but by their motion. 3. If fishes breath air in the water, why doe they die when they are in the air ? If any say, It is because they cannot endure the coldness of the air ; I answer, That the water is colder then the air. Again, we see, that the hotter the air is, the fishes die the sooner. Hence it is observed, that Eels live longer in a Northern then in a Southern wind, and these live longer out of the water then other fishes , because their heat is in a more viscid and slimy humidity then others. Hence it is, that the parts cut off doe live and move sometime, because their heat is not easily dissipated in so slimy a matter. But some will object, That fishes out of the water gape for air, therefore they breath. *Answ.* To gape, or open the mouth, is no argument of breathing, except we will give respiration to Oysters which sometimes gape. Again, fishes gape not for air, but for water : so men in the water, being almost stifled, gape, not for water, but for air. *Object.* 2. The air penetrateth into the thick earth, therefore much more into the thin water. *Answ.* I deny that air can penetrate into the thick parts of the earth ; for that were to make penetration of dimensions, but onely to avoid vacuity the air enters into, and fills up the holes and cavernosities of the earth : for if the air could pierce the thick earth, there would never be earthquakes;



quakes; and if that air which is mixt with the substances of the earth, were sufficient for respiration, Moles needed not take so much pains as to work through and make cavities purposely for respiration. For shut up a Mole within a parcell of earth which he cannot dig through, he will die for want of sufficient air. *Object. 3.* Exhalations and vapours arise out of the water, which shews there is air. *Ans.* These exhalations are the thinner parts of the water turned into vapours by heat or motion; whence it will not follow, that air is in the water actually, or a body separated from the water, in which are not cavities, as in the earth, and much lesse will it follow, that fishes breath in the water, though there were air in it, seeing they want the organs of breathing, as is said. *Object. 4.* Fishes inclosed in a vessel halfe full of water, strive to get up into the air. *Ans.* This striving to get uppermost, is not to enjoy the air, which is not their element, but to get out of prison, and to have more scope, being straitned in a narrow vessel: so fishes in the net struggle to get out, and to be at liberty. *Object. 5.* Fish in a close vessell die for want of air. *Ans.* They die for want of sweet water, which being included from fresh air, degenerates and putrifies. Hence fish die in a pond that is long frozen; because the water for want of agitation and fresh air, becomes unwholsome to the fishes, which yet can live a moneth together under the Ice, without any air. *Scaliger* shewes that he hath kept fish in a close vessel, who have lived, and the same in an open vessell who have died. It is also manifest, that Leaches in a close glasse will live whole years without air. *Object. 6.* *Pliny* objects against *Aristotle*, that as some creatures have not blood, but an humor; so some fishes want lungs, but have some other instrument by which they breath. *Ans.* It is as easie for us to deny, as for him to affirm that which he could never prove: For neither doth he shew what these fishes be, nor what are these instruments, nor (though there were such) can he prove that they breath by them. And though some creatures have an humor in stead of blood, yet that humor hath not the properties, qualities, nor office of the blood. *Object. 7.* Fishes gape, therefore they breath. *Ans.* Here is no sequell; for Oysters gape, which breath nor, and many creatures breath which gape not. Again, if with their gaping there were any breathing, we should see (saith *Aristotle*) the breathing parts move: but there is no motion at all, and it is impossible there should be attraction and emission of the air without motion. Besides, if Fishes breathed, we should see  
some



some bubbles on the water when their breath went out, as in breathing animals when they die in the water. It is true that lunged fishes, such as Dolphins, Whales, Seals, and Frogges, make bubbles, because they breath, which will not prove that all fishes do so. And yet there be other causes of bubbling besides expiration: for rains, tempests, vapours, or any agitation of the water will cause bubbling. *Object. 8.* The Moon gives increment to shell-fishes, therefore their spirits also do increase. *Answer.* It's true, if they speak of the animall and vitall spirits; but what is this to breathing, the subject whereof is the air, and not those innate spirits: and if increment of substance doth suppose respiration, then trees must breath as they grow in bignesse. And although the Moon causeth humid bodies to swell, yet she doth not make the air by which we breath, being a part of the Universe. *Object. 9.* Fishes doe smell and hear, therefore they breath, because air is the matter of all three. *Answer.* Air indeed may be called the matter of breathing, but not of hearing and smelling; it is not the air we smell or hear, but we smell the odors, and hear the sounds in the air, which is therefore properly called by Philosophers, the *Medium*, not the *matter* of hearing and smelling. And as the air is to us, so the water is to fishes the *medium* of hearing and smelling: And if it be the matter of breathing to fishes, then it is not air but water which they breath; whereas indeed water cannot be the subject or matter of breathing, nor can they breath at all which want the organs of breath. *Object. 10.* No animall can live without respiration, therefore fishes breath. *Answer.* The antecedent is denied; for many animals live without respiration, onely by transpiration, such are insects, so doth the child in the matrix, so do women in their histericall passions, these breath not, yet they live. *Object. 11.* *Pliny* tells us that fishes do sleep, therefore they breath. *Answer.* Breathing hath no relation to sleep, it is neither the effect, nor cause, nor quality, nor part, nor property, nor consequent of sleep: for some animals sleep, which breath not all that time, as Dormice in Winter, the child in the mothers womb breathes not, as having in the matrix or membran within which he lieth, no air at all, but a watrish humor, which if he should suck in by the lungs, he would be presently suffocated; yet at that time the child sleepeth. There is no community at all in the subject or organ of sleep and respiration, nor in their natures, the one being a rest or cessation, the other a motion; the one consisting in the senses within the head, the other in the lungs, breast, and



and Diaphragma. Again, respiration consists rather in the actions of life and sense, which accompany waking, then in sleep, which resembles death. Respiration is for refrigeration of the heart, which is more heated by the motions of the body whilst we are awake, then by rest when we are asleep; therefore men that walk, labour, run, struggle, or whose heart is heated by anger, or Feavers, breath much faster then in sleep, as standing more in need of air for refrigeration. So children because of their heat breath faster then old men. Therefore we conclude with *Aristotle*, that fishes which want lungs & throats, & have gills, breath not; for what needed lungs to draw in air, seeing Nature hath given them gills to let in water for cooling the fishes heat, wch is but weak, because they have little blood.

I I. That some small fishes have been found on hills farre from the Sea, is verified by divers; as also that sometimes fishes are digged out of the earth, which we may call *Fossil*, to distinguish them from aquatile, is recorded by grave and ancient Writers: But I believe that these are not true fishes, but rather terrestriall creatures resembling fishes in their outward shape; for as many fishes resemble terrestriall animals, which are not therefore properly terrestriall, so many terrestriall creatures may resemble fishes, which properly are not such; or else where these *Fossil* fishes are found, there are subterraneall waters not farre off, by which they are conveyed thither. Hence sometimes fishes have been found in deep wells; and I have read of some fishes found in springs of sulphury and allum water: for otherwise fishes can no more live in the earth, then earthy creatures in the water, seeing nothing can live out of its own element, where it hath its originall food and conservation. Or lastly, these land fishes have been such as have fallen out of the clouds: For I have read in good Authors of divers showers or rains of fishes, and of Frogs and Mice, and such like animals, out of the clouds.

III. That Fishes in Moon-shine nights, chiefly when she is in the full, delight to play upon the superficies of the water, is plain by fishermen, who take greatest quantiries of them then. The cause of this may be the delight that fishes take in the light, or else they finde some moderate heat in the superficies of the water when the Moon is full: but I rather think it is the pleasure they take in the Moon light, which gives a silver brightnesse to the water, and Nature hath given them a quick sight and eminent eyes, whereas the senses of smelling and hearing are in them, yet the organs are so obscure they cannot



not be found; and albeit they have all the senses, yet they are dumb, for they make no sound at all, because they breathe not, nor have they the organs of sounding, such as the throat, windpipe and lungs.

IV. That some fishes resemble men in their faces, hands, and other parts, is no fable, for such are not only recorded by the ancients, but also have been seen by late Navigators, *Letius* saw none of them, yet relates that an *American* fisherman cut off the hand from one of those fishes which did offer to get into his boat, the hand had five distinct fingers like ours, and in his face he resembled a man. *Scaliger* writes that one of those sea-men, or men-fishes was seen by *Hierom* Lord of *Noricum*, which laid hold on the cable of his ship, this story he related as a truth to *Maximilian* the Emperor. These fishes were called anciently *Tritons*, *Nereides*, and *Sirenes*, one of those *Scaliger* saw at *Parma*, about the bignesse of a childe of two years old. In some part of *Scythia* *Pliny* shewes that men did feed upon these fishes, which some condemned for Canibals, but injuriously; for it is not the outward shape, but the soul which makes the man; neither doth the soul or essence of man admit degrees, which it must needs do, if those *Tritons* were imperfect men; neither is it unlikely what is written of the River *Colhan* in the Kingdom of *Cobin* among the *Indians*. That there are some human shaped fishes there called *Cippæ*, which feed upon other fishes, these hide themselves in the water by day, but in the night time they come out upon the banks, and by striking one flint against another, make such a light, that the fishes in the water being delighted with the sparkles, flock to the bank, so that the *Cippæ* fall upon them and devour them. This I say is not improbable, if we observe how many cunning ways nature hath given to the fox, and other creatures to attain their prey. *Scaliger* wonders why these *Cippæ* do not rather catch their prey in the water, then to take so much pains on the bank; but the reason may be, that either these *Cippæ* are not so nimble and swift as those other fishes, or else that these fishes will not come near them, being afraid of their human shape, which is formidable to all creatures.

V. That Fishes are not dull and stupid creatures, as *Cardan* and some others do think, is manifest by their sagacitie and cunning they have, both to finde out their prey, and to defend themselves from their enemies. The fish called *Uranioscopus*, deceives the other fishes by a membran which he thrusts out of his



his mouth like a worm, which they supposing to be so, lay hold on it, and so are catch'd. Herrings being conscious of their own infirmities, never swim alone, but in great shoals, and the whales who prey upon the herrings, by a natural instinct frequent those seas most, where there be most herrings; and I have observed in the Northern seas for a mile or two in compass the sea covered with herrings flying from their enemies, the whales which were in pursuit of them, tumbling like hills on the sea; but by reason of their huge bodies and slow motion, could not overtake them; and when the herrings are in any danger, they draw as near to the shore as they can, that the whales pursuing them, may run themselves on the sand, where they stick, as often times they do, and so become a prey themselves to man: thus in one year 80 whales run on the Islands of Orkney, where I have been a whole year together; so that the Bishop of those Islands had 8 whales for his Tithe that year. There are also in the Northern seas, fishes about the bigness of an ox, having short legs like a beaver, and two great teeth sticking out, of which they make handles for knives; these fishes are called Morse, they sleep either on the ice, or upon some high and steep place on the shore, when they sleep they have their Centinel to watch, who in danger, by a sound he makes, awakes them, they presently catch their hindmost feet in their mouth, and so roule down the hill into the sea like round hoops or wheels. The cunning also of the Cuttle fish, or Sepia may be alledged here, who to delude the fisherman, thickneth the water with his black ink, and so escapeth; The Torpedo, and other fishes may be produced for examples of their cunning, and the Dolphins for their docility, but these may suffice.

*VII.* Though God hath given to some fishes feet, and wings, as well as fins, yet not in vain; for these Amphibia that were to live on the land as well as in the water, stood in need of feet for walking as well as of fins for swimming; and those winged fishes being not such swift swimmers, as to escape the dangers of their enemies, the Ducades, by their fins, were to avoid them by their wings; hence being pursued in the water, they fly in the air till they be weary, or far enough out of danger, then they fall down into the water again. 'Tis commonly thought that they fly so long as their wings are moist, and fall down when they are drie; but I see no reason why moisture should help their flight, when it hinders the flying of birds, which fly swiftest when their wings are driest. Swallows indeed



deed and other birds, do sometimes wet their wings, not to help their flight, but to cool and refresh their heat.

VII. That there are many monstrous fishes in the sea, is not to be denied in a grammatical sense, nor in a Philosophical, if we speak of individuals; for in such both by land and sea, there be divers aberrations of nature; though there can be no specifical monsters except we will make the first cause to have erred in his own work, and first production of things; yet in a grammatical sense, even the species of some fishes may be called monsters, *à monstrando*, for their hidious and uncoth shapes demonstrate Gods greatnesse and power, and his goodnesse also, in that he makes them to serve our uses, and they may also demonstrate what should be our dutie to God, when we look on them, even to praise and honour him, who hath not made us like one of them. The whale then to us is a monstrous creature, when we look upon his huge bulk, and strange shape, and motion, the quantity of water, and manner of spouting it like flouds out of his head; for each whale hath a prominent spout on his head, and some have two, (though Dr. Brown denies it, yet *Olaus* an eye-witnesse proves it) by these pipes they breath, and send out the water which they drink in: and it is none of the least wonders that these vast creatures should be caught and subdued by the art of man. In *Norway* they are taken by the smell of Castoreum, which stupefieth their senses; in the *Indies* they are taken by stopping their holes and vents by which they breath, so that being stifled they submit to the poor naked conquering *Indian* who sits upon him, as on horseback, and with a cord drawes him to the shore. *Acosta* tels us of a strange fish called *Manari*, which ingenders her young ones alive, hath teats and doth nourish them with milk, it feeds on the grasse, but lives in the water; it is of a green colour, and like a cow in the hinder parts, the flesh is in colour and taste like veal. The Shark or *tiburon* is a strange fish, out of whose gullet he did see drawn, a butchers great knife, and great iron hook, and a piece of an oxes head, vvith one vvhole horn, their teeth are as sharp as rasors, for he savv Sharks leap out of the vvater, and vvith a strange nimblenesse snap off both the flesh and bone of a horses leg hanging upon a stake, as if it had been the stalk of a lettice. That vvvas a monstrous fish vvwhich *Scaliger* speaks of, having a hogs head vvith vvvo horns, and but one bone in all irs body, on vvwhose back vvvas a bynch resembling a saddle. In the lake *Amara* of *Ethiopia* is a kind of *Conger* having a head like



a toad, and a skin of partie colours. In the *Ethiopian* sea is a fish resembling a hog in his head and skin, vvith long ears, and a tail of tvvo foot in length. No lesse monstuous is the *Hippocampus*, a fish like a horse in his head and neck, having a long main, the rest of his body is like our painted dragons. He speaks also of a fish like a leather purse vvith strings, vvich vvill open and shut. There is a fish having the resemblance of a calves head vvith horns. There are fishes that have four ranks of teeth, and in every rank fifty teeth. *Rondoletius* speaketh of fishes in vvhose bellies have been found men arm'd at all assaies. The *Uletif* is a fish having a savv on his forehead three foot long and very sharp. *Thevet* tells us of a fish in the *Sarmatique* sea, having horns like those of a hart, on the branches vvhereof are round buttons shining like pearl, his eyes shine like candles, he hath four legs, long and crooked pavves, vvith a long speckled tail, like the tail of a Tigre, his muzzle round like a cats, vvith moustaches round about. There are sea-serpents of tvvo hundred cubits long. Some fishes have been found resembling mitred Bishops, others hooded monks, and divers more shapes there are : but none more strange then that vve read of in the *Storie of Harlem in Holland*, out of vvhose lake vvas fish'd a sea-vvoman, vvich by a spring tide had been carried thither, vvhen she vvas brought into the Tovvn, she suffered her self to be clothed, and to be fed vvith bread, milk, and other meats, she learned also to spin, to kneel before the crucifix, and to obey her Mistresse, but she could ne be brought to speak, and so remained for divers years dumb. They that vvill see more of fishes, let them read *Aristotle, Pliny, Olaus Magnus, Arbian Oppian, Rondoletius, Gesner, Aldrovandus, Belon* and others.

## CHAP II.

1. *Publick and privat calamities presaged by owles.*
2. *By dogs.*
3. *By ravens, and other birds, and divers other ways.*
4. *Wishing well in sneezing, when and why used.*
5. *Divers strange things in thunder-struck people.*

**T**hat destruction and mortality are oftentimes presaged by the skrieing of ovvles, the houlung of dogs, the flocking together and combating of ravens, and other birds, and by divers other ominous signes, is no Gentil superstition, or  
Vulgar



Vulgar Error, as Dr. Brown (Book 4. c. 21.) would have it, but a truth manifested by long experience. *Lampridius* and *Marcellinus* among other prodigies, which presaged the death of *Valentinian* the Emperor, mention an owle which sate upon the top of the house, where he used to bathe, and could not thence be driven away with stones. *Julius Obsequens* (in his book of Prodigies c. 85.) shewes that a little before the death of *Commodus Antoninus* the Emperor, an owle was observed to sit upon the top of his chamber, both at Rome, and at *Sanuvium*. *Xiphilius* speaking of the prodigies that went before the death of *Augustus*, saith that the owle sung upon the top of the Curia: *ὅτι αὖ καὶ ὄνυχος ἐβύζε*, &c. he shewes also that the *Asian* war was presignified by the flying of owls into the Temple of Concord in the year 1542 at *Herbipolis* or *Wirtzburg* in *Franconie*, this unluckie bird by his schrieking songs affrighted the Citizens a long time together, and immediately followed a great plague, War, and other calamities: *Pliny* (lib. 10. c. 12.) shews that this abominable and funeral bird, as he calls it, portended the Roman destruction at *Numantia*; and therefore one time being seen in the Capitol, so affrighted the City, that Rome was purified to prevent the evils which that owle presaged. *Balthasar Cossa*, who was Pope and named *John* the 24th was forewarned by an owle (that appeared over against him as he sat in Council) of the troubles which justly fell on himself, and by his means on others. About 20 years ago, I did observe that in the house where I lodged, an Owl groaning in the window presaged the death of two eminent persons who died there shortly after. Therefore not without cause is the owl called by *Pliny*, *Inauspicata* & *funeris avis*, by *Ovid*, *Dirum mortalibus omen*, by *Lucan*, *sinister bubo*; by *Claudian*, *inestus bubo*. and the Prince of Poets, among other ominous portenders of *Q. Dido's* death, (*Æn.* 4.) brings in the owls schrieking and groaning.

*Solaq; culminibus ferali carmine bubo  
Sape queri, & longas in fletum ducere voces.*

And in another place he makes the owl presage the death of *Turris*, *Æn.* 12.

*Quæ quondam in bustis, aut culminibus desertis  
Nocte sedens serum canit importuna per umbram.*

II. That dogs also by their howling portend death and calamities,



1. amities, is plain by Historie and experience. *Julius Obsequens* (c. 122.) sheweth that there was an extraordinary howling of dogs before the sedition in *Rome*, about the Dictatorship of *Pompey*, he sheweth also (c. 127.) that before the civil Wars between *Augustus* and *Antonius*, among many other prodigies, there was great howling of dogs, near the house of *Lepidus* the Pontifice. *Camerarius* tells us (c. 73. cent. 1.) that some German Princes have certain tokens and peculiar presages of their death, amongst others are the howling of dogs. *Capitolinus* tells us that the dogs by their howling, presaged the death of *Maximinus*. *Pausonius* (in *Messe*.) relates that before the destruction of the *Messenians*, the dogs brake out into a more fierce howling then ordinary, *Βιολαεγ. τῇ κερυγῇ χροῦμενοι*, and we read in *Fincelius* that in the year 1553, some weeks before the overthrow of the *Saxons*, the dogs in *Mysina* flock'd together, and used strange howlings, in the woods and fields. The like howling is observed by *Virgil*, presaging the Roman calamities in the *Pharsalick War*:

*Obscæniq; canes, importunæq; volucres*  
*Signa dabant.*——

So *Lucan* to the same purpose: *Flebile sævi latravere canes*: and *Stattius*: *Nocturniq; canum gemitus*.

III. By ravens also and other birds, both publick and privat calamities and death have been portended. *Jovianus Pontanus* relates two terrible skirmishes between the ravens and the kites in the fields lying between *Beneventum* and *Apicium*, which prognosticated a great battel that was to be fought in those fields. *Nicetas* speaks of a skirmish between the crows and ravens, presignifying the irruption of the *Scythians* into *Thracia*: The cruel battels between the *Venetians* and *Insubrians*, and that also between the *Liegeois* and the *Burgundians*, in which above 30 thousand men were slain, were presignified by a great combat between two swarms of emmets: In the time of King *Charls* the 8 of *France*, the battel that was fought between the *French* and *Britans*, in which the *Britans* were overthrown, was foreshewed by a skirmish between the magpies and jackdaws: I have read also of skirmishes between wild-ducks and wild-geese; likewise between water and land serpents, premonstrating future calamities among men. In this land of late years our present miseries and unnatural wars, have been forewarned by armies of swallows, martins, and o-  
the



ther birds fighting against one another : And that privat men have been forewarned of their death by ravens, I have not only heard and read, but have likewise observed divers times: a late example I have of a young gentleman, Mr. Draper my intimate friend, who about five or six years ago, being then in the flower of his age, had on a sudden one or two ravens in his chamber, which had been quarrelling upon the top of the chimney; these he apprehended as messengers of his death, and so they were; for he died shortly after. There is then no superstition in the observation of such things; for God is pleased sometimes to give men warning of their ends by such means; so we finde in the life of *Cicero*, who was forewarned by the noise and fluttering of the ravens about him, that his end was near; which proved true, for the murtherers sent by *Mark Antonie* slew him presently after in his Sedan: Why may not God forewarn men of their future death and calamities by birds, as well as by generation of monsters, apparition of comets, strange showres of frogs, blood, stones, and such like; I saw a little before these last troubles of *Germany*, divers *Parseleons*, or *Moors* with crosses in the air, not long before the appearing of the last blazing star. Why is it less superstitious to observe such uncouth meteors, then uncouth actions of birds and beasts, or why is there less credit to be given to the one then the other, seeing God can make use of all his creatures as he pleaseth: therefore he that imployed a raven to be a feeder of *Elias*, may employ the same bird as a messenger of death to others. *Camerarius* out of *Dietmarus* and *Erasmus Stella*, Writes of a certain fountain near the river *Albis* or *Elbe* in *Germany* which presageth Wars by turning red and bloody coloured. Of another which portendeth death, if the water which before was limpid, becomes troubled and thick, so caused by an unknown Worm. There is a noble Family in *Bohemia* vvhich is forewarned of death, by a spectrum or ghost appearing like a Woman cloathed in mourning. Such an apparition had Mr. *Nicholas Smith* my dear friend, immediatly before he fell sick of that feaver vvhich killed him: having been late abroad in *London*, as he vvas going up the stairs into his chamber, he vvas embraced as he thought by a Woman all in vvhite, at vvhich he cried out, nothing appearing, he presently sickneth, goeth to bed, and vwith in a vveek or ten days died. Novv vvhether these things be true and real, or only imaginary in the phantasie, I vvill not here dispute; it is sufficient that by such means many are forewarned of their ends,



as *Brutus* was in his Tent, to whom his evill Genius appeared the night before he died. And why may not our tutelary Angel by these and such like means, give us warning of our dissolution? We read in Histories of a Crow in *Trajan's* time, that in the Capitoll spoke, *ἔσαι πάντα γαλῶς*; All things shall be well. And *St. Hieron* tells us, that the Ravens fed the two *Eremites*, *Paul* and *Anthony* many yeares together with bread. The same God that imployed these birds as Stewards to feed his servants, may also use them as messengers to warn them of their migration. And yet in this I doe not patromize the heathen augurations, who in all their actions depended superstitiously upon the chattering, flying, and feeding of birds, then the which nothing could be more vain, seeing they cannot naturally foreknow the death of others, who cannot fore-see their own; as that *Roman* Commander made appeare to his Army, who shot the bird dead, by whose chattering the *Augur* would have hindered the Armies march. Yet from hence it will not follow, that all observations of meteors or animals are superstitious, or that they do not fore-warn at all death and future calamities, seeing Historie and experience reach the contrary: and *Christ* sheweth, that before the destruction of *Jerusalem* there shall be signes from heaven in the Sun, Moon, and Starres, and Sea, which *Josephus* confirmes. *Obsequens* tells us, That at *Rome* was extraordinary thundring immediatly before *Catilines* conspiracy; the like was before the *Pharsalick* battel, as the *Roman* Stories inform us: in which also we find, that before the invasion of *Italy* by the *Goths* under *Alaricus*, by the *Huns* under *Attila*, and by the *Lombards* there was more then usuall thundring and lightning, presaging the calamities that were to fall on that Countrey. And this very houre that I am writing this discourse, (*Aug. 23. anno 1651.*) I observe that it hath continued thundring and lightning almost 14 hours with some short interruptions; whereas usually thunder lasteth not above an houre or two: By which I fear me God is forwarning this Land of the horrible bloodshed and calamities which are suddenly like to fall out among us, which we beseech God in his mercy to avert, and to give us all repenting and relenting hearts.

IV. That sneezing or sternutation was superstitiously abused by the *Centiles* in divination, is manifest by their writings, who used to fore-tell good or bad events by sneezing: they held that propitious which was in the afternoon, and towards the right hand; but to sneeze in the morning, or towards the



left hand, was counted unlucky, as *Aristotle* sheweth. So superstitious they were, that if they sneezed whilst they were rising in the morning, they would to bed again; and if any sneezed at Table whilst the meat was taking away, they would set down the meat again. If the Generall of an Army did sneeze when he was going to fight, he would forbear fighting that day, such an ominous thing they held sneezing to be: On the other side, at *Monopotama* sternutation was of such high esteem, that when the King sneezed, all the people would fall down and worship him; and proclamations were sent abroad to give notice to all the Kings subjects of his sneezing, to the end they might rejoyce and worship. Among the rest of the Gentiles ridiculous opinions, this was one, That *Prometheus* was the first that wisht wel to the sneezer, when the man which he had made of clay, fell into a fit of Sternutation upon the approach of that celestiall fire which he stole from the Sun. This gave originall to that custome among the Gentiles in saluting the sneezer. They used also to worship the head in sternutation, as being a divine part, and seat of the senses, and cogitation. They held also sternutation one of their gods: & because their chiefest soothsayings and divination was by Birds, hence sternutation was called *ἀρνὴς* a Bird by them: & by reason it is the action of the brain which is the seat of the senses, therefore in *Aristophanes* the word sneezing is used for feeling; as when he saith, *I sneezed not the blow*, his Interpreter expounds it, *I felt it not*, as *Calius* observeth. But now because the Gentiles abused sneezing superstitiously, and wished well to the Sneezer, we must not hence inferre, That to pray for the safety of him who sneezeth, is superstition or Gentilisme, as some do: for so we may conclude by the same reason, that to pray at all is superstition, because the Gentiles used to pray. It is an ancient custome among Christians to wish well to him that sneezeth, taking its originall from the time of *St. Gregory*, when at *Rome* in a great sicknesse, men died with sneezing *Doctor Brown* one of *Fernandes* brings some proofes to shew, that the original of wishing wel to the sneezer, is more ancient then *Gregory*; to whom I answer, That it was used among the Gentiles before *Gregories* time; but I deny that it was usuall among Christians till then. From this sicknesse therefore at *Rome* in *Gregories* dayes, in which this wel-wishing was used, and not from the Gentiles practice, we draw this civill and charitable custome in praying for our friend or neighbour when he sneezeth.



## Thunder-struck persons.

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V. In those that are thunder-struck, divers things are remarkable, as, 1. They keep the same posture of body being dead, which they had when they were alive at the time when they were struck, as *Cardan* (*de rer. var. lib. 8. c. 44.*) instanceth of 8 harvest people in the Isle *Lemnes*, who sitting together under an Oak at supper, were all thunder-struck, retaining the same posture they had before; one with his hand on the cup ready to drink, the other with the cup at his mouth; a third with meat in his mouth; so that they looked like so many statues. The reason of this may be the stiffness of the nerves and muscles, being parched and dried up by the hot and sulphury matter of the lightning. The like I read of those that are killed with excessive cold, which so stiffeneth those parts mentioned, that the body retains its posture whether sitting or standing. 2. They that are thunder-struck look black, because the heat drieth up the radicall moisture. The like we see of fire, which makes the whitest paper and linnen grow black, and the Sun tans mens skins. 3. Their bodies do not putrefie, by reason their moisture, which is the mother of putrefaction, is exhausted. 4. There is neither wild beasts nor ravenous birds will touch or come neere such bodies, because of their sulphury smell which is noisome to them, and their driness is such, that they can afford no nutriment. 5. That part which is wounded by the thunder, is colder then any other, notwithstanding that the lightning or thunder is of a fiery nature; because all things which have been heated by the fire, grow colder then before, by reason the inward heat is drawn out by the fire; for in things of the same nature or quality, the stronger attracts the weaker. 6. The *Romans* never suffered their bodies to be burned that were thunder-struck, but covered them with earth in the same place where they were struck, or let them remain unburied, nor would they suffer any funeral obsequies to be performed to them: perhaps they thought it unfitting to burn those with terrestriall fire, who had been scorched already with fire from heaven, or to take the shape away, or figure of that body with their fire which the celestiaall fire had spared: nor would they honour him with a funerall whom they thought execreable, and extreemly hated of the gods: therefore none would venture to come neer the place, till it was expiated by a sacrifice, which was called *Bidentall*, being a sheep of two years old, or of two eminent teeth; which word also by *Persius*, is given to the party that is thunder-struck, whom he calls *evitandum Bidentall* (*Se&.*



2.) because none durst touch or come neer him: 7. The thunder seldom or never kills those that are asleep, but such onely as are awaked: this may proceed from the fear which is in those that are awaked, by which the spirits & blood suddenly suffocate the heart, whereas in sleep there is no fear or apprehension of danger; and not only men, but cattell also are much afrighted: wherefore in thundring times the shepherds use to gather their sheep together, that being united, they may be the lesse fearfull, whereas any creature alone is subject to be fearfull. 8. It is a strange quality in the thunder to break the bones, to melt the sword, to dry up the wine, to kill the infant in the womb, and yet not touch the skin, the scabbard, the barrell, nor the mother; perhaps the skin and leather being pory, transmits the sulphury vapour, which is resisted by the bones and metall. As for the wine exhausted, I think *Pliny*, *Plutarch*, and others, mean onely the Spirits of the wine evaporated; and so the child being more tender and apter to receive the malignant vapour of the thunder then the mother might die and she live.

## CHAP. III.

1. The Female hath no active seed of generation. Doctor Harvies and Fernelius reasons refuted.
2. A Discourse of the Cholick.
3. The same soul in a subventaneous and prolificall egge. Doctor Harvies reasons to the contrary refuted.
4. Blood not the immediate instrument of the Soul, Doctor Harvies reasons answered.
5. Doctor Harvies way of conception refuted.

WE have proved already (*l. i. c. 4. sect. 3.*) that the female hath no active seed for generation, but is meerly passive, affording onely blood, and the place of conception, according to the truth of *Aristotles* doctrine; but because the Physicians are of another opinion, that the female hath also seed actively concurring to generation, we will examine the solidity of their reasons. 1. Doctor *Harvy* (*Exercit. 32.*) proveth, That in the female there is an active principle of generation, Because of the Horse and Asse is procreated a mixt species, to wit, the Mule, the whole form whereof is made up and mixed of both parents; so that the Horse alone was not sufficient to produce this form of the Mule in the matter, but as the whole form is mixed, therefore the Asse must concur as an other efficient cause. *Ans.* The Mule is not a compounded species, or mixed of the Horse and Asse, but



but rather a third species different from both, as having neither in whole nor in part, nor separated, nor mixed, their essentiall forms, but hath its own specificall form, and properties distinct from those of the parents, as we may see in the Mules sterility, which is a property not individuall as in some other animals; but specificall, of which the species of the Horse and Ass is not capable. As for some outward resemblances in the Mule to the parents, these are but accidentall, and are in animals of farre different species, as also in trees, and other vegetables. Besides, the forms or species of things cannot be mixed, because essences are impartible, and admit no intentions nor remissions: the form then being simple and indivisible, cannot be made up of two, so that two seeds cannot concur as two efficient causes to make up a third entity. For, *Ex duobus entibus per se, non fit unum ens per se.* Again, we see that trees and plants are generated of one seed without copulation; for the earth concurs, not by affording another seed to propagate, but as the matrix to cherish and foment. So in fishes, which have no distinct sex, there is generation, notwithstanding, because in them there is seed, which is the onely active principle of generation. Again, that outward shape or form which the Mule hath, was not induced by the formative faculty of the females seed; for there is none, as we have shewed, much lesse of the blood, for the plastick vertue resideth not in the blood, but in the Males seed; which of its own particular nature endeavours to form a Horse, but finding the Asses blood (being united now and coagulated with and by the Horses seed, incapable to receive that form of the Horse, is retreated by the superior and generall formative faculty, which aiming at the production of a new species for the perfection of the Universe, generates a Mule. Hence we may inferre, that Mules were not the invention of *Aha*, except we will conclude, that the world was imperfect till that time, which were an injury to God who made the world perfect; but perfect it could not be till the production of this species: for *Perfectum est cui nihil deest.* The Doctors second Argument, (*Exercit. 34*) is taken from the production of the egge, which Aristotle holds is generated by the Hen, and which hath also vegetation from her. Hence he inferres, *That according to Aristotles mind, the Hen is an active principle in generation.* Answ. From hence it will not follow, That the Hen is an active principle in the generation of the Chick, because she furnisheth the Egge, which is the materials of the chick; for so in other animals the



female furnisheth blood, which is the matter of which the Embryo is made; and yet she is not, as we have said, an efficient cause of generation, but the male onely by his seed; neither will it follow, that vegetation doth still presuppose generation; for in many individuals there is a vegetive soul, and yet no generation, so there is in some species, as in Mules, in *adanthum* or *capillus veneris*, which we call Maiden-hair, and divers other hearbs which generate not, though they have vegetation. But when *Aristotle* saith, The egge is generated in the Hen, or that the female generates in her self, he takes generation in a large sense, for any way of production; so we say water is generated of air, and worms of putrid matter, and yet neither the one nor the other is the efficient, but the material cause onely of generation. And though we should yeeld that the Hen were the efficient cause of the egge, yet it will not therefore follow, that she is the efficient cause of the Chick, for that is onely the Cock, as *Aristotle* holds: though in the woman there is a working faculty of her blood, yet there is no working faculty in her of the child or Embryo; that is meely from the plastick power of the fathers seed.

II. Now let us see *Fernelius* his Arguments, (*l. 6. de hom. procreat.*) the first whereof is this, *The womans seed hath no other originall from the testicles and vessels then the males seed hath, therefore in her seed there is a procreative faculty.* *Ans.* 1. We deny that there is seed in the woman properly so called. 2. If it were so that she had seed, yet it will not follow that it is prolificall; for it must be concocted & spirituous, because the spirits are the prime instruments of Nature in generation: but the the womans seed is crude, because that Sex by nature is cold, being compared to the man, as both *Aristotle* and *Galen* affirm, and experience doth evince; for the woman is much weaker and slower then the man, whereas strength and agility argues plenty of spirits and calidity: The mans hairs also are more curled, stiffe and strong then the womans, which shews more heat. The womans voyce is weaker and smaller, which argues the narrowness of the vessels, and consequently defect of heat, and because the woman is lesse hot and dry then the man. Hence it is that she abounds much more in blood, which in man is dried up. Besides, the woman is the more imperfect Sex, her seed therefore must be imperfect, and consequently not fit to be the principall or efficient cause of so noble an animall as man. *Aristotle* observeth, that boyes in the mothers womb are more lively, and nimbler then maids, that they are



are sooner formed in the matrix, and that the woman sooner groweth to her height, and sooner decayeth, her strength quickly fails her, and old age assaults her soonest. Secondly, he proves, *That the child drawes the Gout, Stone, Epilepsie, and other hereditary diseases from the mother, who was subject to these her selfe.* Answ. This will not prove that the mother is an active cause in generation, or that the formative faculty is the cause of diseases, which rather are to be attributed to the matter of which the similar parts are formed, then to the active principle of generation; whereas then the woman furnisheth blood, of which our bodies are made up, it is no marvell if with the blood she imparts to the child whatsoever infirmities is in it; and not onely doth the mother by her blood, but the father also by his seed, communicate diseases to the child: for the same seed which is the efficient cause of generation, is also the materiall cause of infirmities and diseases. Hence many times gowty fathers beget gowty children. His third Argument is, *The child oftentimes resembleth the mother, therefore her seed must needs be active.* Answ. That the child for the most resembleth the mother, proceedeth not from any agencie of her seed, but from the strength of her imagination; for otherwise the child would still resemble the father, in whose seed alone resideth the formative faculty, which because it is a naturall power depending from the generative, and consequently inferior to the imagination, which is an animall faculty that giveth place to this. This force of the mothers imagination is plain by the divers impressions made on the tender Embryo upon her depraved imaginations, by the stories of those women who have conceived children resembling the pictures hanging in their bed-chambers, and by the practise of *Jacob, Gen. 30.* in causing his Ewes to bring forth streaked Lambs, according to the streaked rods put in their troughes when they drank.

II. There is no disease that more molests and tortures man then the Cholick, which is so called from *Colon*, the great intestine; the torment of which hath made some to kil themselves: nor is there any malady that proceeds from more causes, or hath more strange and various cures: sometimes it proceeds of intemperance in eating and drinking; sometimes from the quality of the meat and drink we use; sometimes also from the malignity of the medicament we take: In some it is caused by choler in the intestine, in others by flegme, in others by flatulency: In some upon costivenesse and retention of the feces: in others upon fluxes and too much evacuation: In others a-



gain it is procured by the rupture of the *Peritonæum*, and lapse of the intestine into the *Scrotum*. Sometimes this disease is procured by the distemper of some adjacent part, sometime by stones bred in the intestines; sometimes by wormes generated there; sometimes by congealed blood in the same place; sometimes by a wind; in many it is caused by drinking cold water; in others by sitting on a cold stone, and in some by impure venery; sometimes the malady is in the cavities of the Colon, sometimes in the tunics; and sometimes it is bred by the infection of the air; and sometimes by the contraction and shrinking of the intestines. Thus wee see of what brittle materials we are composed, how careful we should be of our diet, and how many wayes God hath to punish us for sin. Like to this disease is the *Iliaca passio*, so called from the *Ilium*, a smaller intestine, which is sometimes so violent, and the obstructions below so great, that the excrements for want of passage downward, recoil upward by vomiting. Many likewise are the ways by which the Cholick is cured. For, besides the ordinary ways of curing by purging, vomits, clysters, phlebotomy, and outward fomentations, there be divers extraordinary wayes, some are cured by the smoke of Tobacco used downward; some have been eased by blowing of wind out of a paire of bellows into the intestine, for dilatation thereof; some are cured by drinking of urine, some by the Wolfes excrement dried and powdred, and mixt with white Wine, some by the Wolfs gut, dried, powdred, and drunk with Canary or Malago: others have been cured & preserved by carrying about them the Wolfs excrement, the flesh of a Lark either boyled or burned into ashes, and so taken in three spoonfuls of warm water, hath cured some. The *Thracians* used to cure themselves of this disease, by carrying about them the heart of a Lark, being taken out whilst he was alive. A Goats liver is commended by some for a present remedy, if it be burned, powdered, and drunk in wine. Some commend the infants navel-string being cut off, salted, & carried in a Box. Others have good by a hogges blind gut worn about them; the decoction of Mints by some, and of Horehound by others, are singular remedies, so are snakes, if they be burned, powdered, and drunk in wine. Some have been eased by drinking snow and sugar, and by applying of cold snow to the part that was pained. A Bulls pizle is commended by some for a present help, if it be powdred, a scruple whereof in Malago wine will give ease. Some have been cured by drinking down quicksilver,



silver; and experience shews us, that swallowing of gold & nor leaden bullets, are present helps, because with their weight they open the passages and make way. I have eased my selfe of that pain by drinking white Wine in which onions have been steeped all night. Thus as God hath divers ways to punish us, so he hath as many wayes to ease us, & that very strangely: for who can give a reason of those occult qualities or antipipathies which are between this malady, and most of these remedies now mentioned? But of this see *Fracastorius, Forestus, Fernelius, Fonseca, Zacuta, Rondeletius*, and other Physicians.

III. That there is the same soule in a subventaneous egge which is in a prolificall, may appear by the same properties and effects in both, because in both is accretion, nutrition, attraction, retention, concoction, &c. which are the effects of the vegetive soule; yet Doctor Harvy (*Exercit. 25.*) denies this, Because (saith he) *If there were the same soule in the subventaneous which was in the prolificall egge, they would both equally produce Chickins.* *Ans.* This will not follow, except he could prove that the vegetive soule produceth the sensitive soule, or the sensitive creature, which cannot be; for no soule can produce another, neither can an inferior faculty produce a superior, by reason the effect cannot be more noble then the cause: The reason then why the subventaneous egge is not prolificall, is not the want of a vegive soule, which we know it hath by the effects thereof; but because that egge was not animated or fecundated by the prolificall sperm, feminall spirit, or spermatick vapour of the Cock. So the blood in a married woman and a maid, hath the same vegetation, though both be not prolificall for want of the mans improlificating sperm. But the Doctor tells us, (*Exercit. 25.*) *That from the male proceeds onely the plastick or formative vertue which fecundateth the egge, because the seed or geniture cannot penetrate into the Hens matrix, or inward receptacles.* *Ans.* The formative vertue being an accident, cannot be derived or conveyed from the Cock to the Hens matrix, without its proper iubject, in which it is inherent. And though in a dead Hen those passages or conveyances cannot appear, yet in the living Hen they are open for the feminall vapour to passe. For this cause in the closure of the Cocks treading, there is a nimble and almost imperceptible touch of both their fundaments, by which then the feminall spirit is conveyed. Again, the Doctor saith (*Exersit. 25.*) *That whereas the soule is the act of an organically body, having life potentially, it is incredible that it should be in a Chick before any part of its body be organized.*



organized. *Ans.* The egge is not altogether a body inorganically actually, seeing it hath different parts. Besides, it is organically potentially, as containing in it all the parts and members the Chick that shall bee. So the seed of other animals contains potentially the animall that shall be, with all its members; therefore the common opinion is, that seed is drawn from all parts of the body, because it contains in it all the parts. As the soule then is in that body which hath life potentially, that is, a possibility to exercise the functions of life; so it is in the body that hath organs potentially, or the faculty of producing organs. Hence the soule cannot be in a stone, which hath not this possibility. Of this opinion is the Doctor (*Exer. 71*) when he saith, *That in the primogeniall humidity of the egge, all the parts of the chick are potentially, but none actually.* Again, he saith, *Exer. 25.* *That in the egge and chick there cannot be the same soule, because they are different entities, & produce different, yea contrary operations, so that the one may seem to be begot of the others corruption.* *Ans.* I deny that the egg & chick are different entities otherwise then *secundum magis & minus*, as an imperfect thing differs from it selfe, when it becomes more perfect; in this respect an infant and a man may be called different entities, and they have their different operations; yet they have the same soule. If then we conclude diversities of things from diversities of operations, we must inferre that every animall is different from it self, because it produceth different operations, and that Peter hath not the same soule when he doth different things. How many different entities must there be in the Sunne, who produceth so many different effects. Neither do I allow of the Doctors Assertion, in saying, *The chick is begot of the egges corruption*; for indeed it is begot of the egges perfection: For then is the egge perfected when the chick is procreated. If by corruption he understand the abolition of the form of the egge, I assent to him, that according to the old Peripatetick Maxime, *The corruption of one thing is the generation of another.* But if by corruption he understand putrefaction, as he seems to doe, I say that then a chick is not, nor cannot be procreated of a putrified egge, which is fitter to breed worms then a Chick.

*IV.* Because the soule is a pure and celestially substance, and our bodies are grosse and earthy, on which so sublimate an entity cannot operate without a *medium*, that may in some sort participate of both natures, therefore God in his wisdom hath interposed the animall and vital spirits as the immediate instruments



ments of the soul to work upon the body. But Dr. Harvy (*Exercit. 70*) will have the blood to be this immediat instrument of the soul, because it is every where present, and runs to and fro with great celerity. *Answ.* Neither can the blood be the immediat instrument of the soul, because the spirits being of a purer essence, come nearer to the nature of the soule, and therefore must be more immediat; neither is there any ubiquitary presence or celerity of motion in the blood, but by the reason of the spirits which drive it to and fro. Besides, all animals have not blood, some being exanguious, yet they have spirits by which they are moved. Again, he saith, *That the blood works above the power of the elements, being the part first begot, and the innate heat doth fabricate the other parts of the body.* *Answ.* The blood works not at all, much lesse above the elementary powers, but by vertue of the spirits; which the Doctor immediatly after seems to acknowledg, when he saith, *It is made the immediate instrument of life, by the gift of the formative faculty and vegetive soule.* Now this formative faculty consisteth immediatly in the spirits, and so doth the vegetive soule, which are even in those parts where there is no blood at all, to wit, in the spermatick parts, according to the doctrine of Hippocrates and Galen. To say then that the blood is the immediat instrument of life, by means of the plastick faculty, is in effect to say, It is not the immediat, because there is one more immediat, to wit, the plastick faculty in the spirits. Neither is the blood the part first begot, as the Doctor saith, if we will believe the Galenists, but the spermatick parts are first begot, if we speak of the formation of the child: neither can the blood fabricate any part at all, being a dull thing in it selfe: but the spirits, or the plastick faculty in them doe fabricate, the blood is onely the materiall cause of the flesh and sanguineall parts, as the Galenists affirm. And whereas the Doctor saith, *That the blood is a spirit, because Virgil saith,*

*Una eademq; viâ sanguisq; animusq; sequuntur;*

He speaks very improperly, for blood and a spirit are specifically different, and if the Poet had meant that blood and a spirit were the same thing, he had used a meer tautologie, which is far from his elegancie; and therefore his words intimate the contrary, that they are different things, because he saith, *Sanguisque animusque*, though then they had but one passage or vent, yet they are not one thing. And whereas he saith, *That the blood is celestially, because the soule lodgeth in it,* he may say the whole body is celestially, being the house and tabernacle of the soul,



soule; which lodgeth in each part thereof, even where there is no blood, as in the bones, gristles, &c. But indeed the spirits are rather to be called celestiall, because in them the soul immediatly resides, and by them in the blood, and other parts. The blood then is not celestial at all, but by the spirits, nor these in respect of their originall, but because of their celestial qualities and operations. Again, when he distinguisheth the principall agent from the instrumentall in this, *That the one can never work above its own strength, whereas the other doth.* I say, this distinction is needlesse; for no agent can work above its own strength, much lesse the instrumentall, which worketh not at all, but as it is moved by the principall agent: The instrument then doth not worke above its own strength, but the prime agent worketh by it, above the strength of the instrument. Besides, when hee saith, *That the blood deserves the name of Spirit, because it abounds more with radicall moisture then other parts, by which it feeds all other parts.* I answer, That the seed deserves rather to be called a Spirit; for though in the blood there is more moisture extensively, yet in the seed there is more radicall moisture: And if that which feeds us immediatly be a spirit, then the blood is no spirit; for it is not that, but a roscid and benigne juice extracted from thence, which immediatly nourisheth us. Lastly, when he saith, *That the soule with the blood performes all things in us;* If he understand here (as he seemes to doe in all his discourse) collaterall efficient causes, I deny his saying; for the soule by the spirits is the sole efficient cause of all that is acted within us, the blood is onely a materiall cause, having no more efficiency in it, then Bricks and Mortar have towards the building of an house. Doctor Harvey (*de Conceptione*) will have the Female conceive and be prolificall without any sensible corporeall Agent, as Iron touched with the Loadstone draweth other Iron to it. Again hee saith, *That the substance of the womb being ready for conception, is very like the constitution of the brain.* Why then should not their function be alike? And what the phantasme or appetite is in the brain, the very same, or its analogy is excited after copulation in the womb; for the functions of both are called conceptions. And shortly after, *As when we have conceived a form or Idea in the brain, wee produce the like in our workmanship;* even so the Idea or species of the Father being existant in the womb by the help of the formative faculty, produceth the lik brood. Then after divers amplifications to the same



same purpose, he concludes, *That it is no absurdity if the female that is made pregnant by conceiving the generall Idea without matter, doth generate.* *Ans.* In this Tract the Doctor seemes sometimes to be in earnest, and sometimes to speak problematically, or rather doubtfully: But however, this opinion cannot consist with reason; for what can be more unreasonable, then that the Noblest Animals should be conceived without any sensible corporeall Agent, by meere imagination, not of the brain, but of the Womb: For, 1. If this be true, that the Female can thus conceive and generate, what need was there of the Male? they are then uselesse in generation, and fathers have no reason to provide for their wives children, seeing the woman is the sole parent, the man but a Cypher. Why should there be any lawes against adultery and fornication, seeing there can be no such sins? If this doctrine be true, what miracle was it for a virgin to conceive and bear a Son without the help of man, seeing this is ordinary for the female, as the Doctor saith, to be prolificall without any sensible corporeall agents; for the seed, he saith, is not received within the matrix. But if I should grant him this (which cannot be true) yet he cannot deny but that the seminal vapour and prolificall spirit is conveyed thither, by which the female is made pregnant; if he grants this, then there is a sensible corporeall agent, though not so grosse as the earthy part of the seed: If he deny this, then it will follow, that we are all produced without fathers, and that there is no other sensible corporeall agent but the womb; and so the fifth Commandement of honoring father should be put out, seeing there is no such thing in nature. Again, if he saith there is no agent, then it will follow, that the effect can be produced without an efficient, and an action without an actor. If he saith there is an agent, but not corporeall, then that agent must be either a spirit or an accident; if a spirit, then we are all the children of spirits, not of corporeall parents, and so man cannot have for his genus a corporeall substance. And these spirits, if created, must be either Angels, Demons, or Souls, which was the dreams of some ancient Hereticks, long since condemned by Councils. If again he saith, that these agents are not spirits, but accidents, he will make us in a worse condition: For man, the Noblest of all creatures, is the child of an accident, therefore *Aristotle* should have placed man in the Categorie of quality rather then of substance. But we know that no accident is operative but in and by the power of the principall agent;  
Neither



Neither can an accident be conveyed into the womb without the subject in which it is inherent: and therefore Iron touched without the Loadstone, cannot draw Iron if the substance of the Loadstone were not imparted to it. Hence we see, that as the substance of the Loadstone in the Iron decays, so the vertue of attraction decays likewise. Again, when he saith, that the substance of the womb is like the constitution of the brain, he speaks very improperly; for neither is the substance of the one like the substance of the other; the one being white, spermatical and cold; the other red, sanguineal and hot; nor can the substance of the one be like the constitution of the other, these being indifferent predicaments, between which there is no similitude, nor is the constitution of the one like unto the constitution of the other, as being of different temperaments, and having different uses; and suppose they were either of the same substance, or constitution, it will not follow, that therefore they must have the same function: The stomach and guts have the same substance and constitution, so hath the brain and pith in the back bone: yet they have not the same functions. Again, when he saith, [that what the fantasm or appetite is in the brain, the same or its analogy is excited in the womb, for the functions of both are called conceptions.] He speaks more improperly then before; for he seems to make the fantasm and appetite one thing, and to be both resident in the brain, whereas the appetite is the inclination of the will, and hath its residence in the heart; the fantasm is the imaginary, or fictitious object of the fantasie, which this internal sense residing in the brains represents to itself; neither of these is excited in the womb, nor any thing like it; for the womb is neither the seat of the fantasie, nor hath it fit organs for it; nor is it the seat of appetite, except by this word he understands an inclination to conception or generation: neither again is this a valid reason, that because the functions of the womb and brain are called conceptions, therefore they are the same; for the conception of the womb is far different from that of the brain, neither do they agree, but equivocally, and in name onely; so this word conception is ascribed to the action of understanding. Lastly, though we can produce upon stone, or timber, or such like matter, some shape or form like that Idea in our brain, yet it will not follow that the species of the father in the womb can produce the like brood; for I deny that the species or idea of the father is in the womb, but in the brain; this (not that) being the proper seat of the fantasie,



tasie, which receiveth the species from the common sense, and the imagination doth not alwayes work upon the seed, or embryo, nor doeth it produce any form, it onely worketh sometimes and produceth but the accidental form ; whereas ordinarily both the essential and accidental forms are produced by the formative power of the seed , or rather by the soul it self, which fabricates its own mansion, which soul lay potentially in the seed, and is excited by the heat, or rather innate property of the matrix. To conclude, it is as great absurdity to affirm that the female can be made pregnant, by conceiving a general immaterial idea, as it was by some of the ancients to think, that the Spanish Mares could, as Aristotle speaks, *ἔξ αὐτοῦ ἀνέμου*, conceive or be made pregnant by the Western wind, and as the Poets saith ;

*Ore omnes versæ, in Zephyrum, stant rupibus altis,  
Exceptantq; leves auras, & sæpe sine ullis  
Conjugiis vento gravida, mirabile dictu.*

The like fabulous impregnations we read of in Ravens by the north winde, and in Partrages by bare imagination.

CHAP. IV.

I. My Lord Bacon's opinion confuted concerning the French disease. 2. Concerning the expulsion of pellets out of guns. 3. Of the wax candle burning in spirit of wine. 4. Of the parts most nutritive in animals. 5. Of the spirits in cold bodies. 6. Of air, fire, water, oyl, whiteness, the hands and feet. 7. Of souls and spirits. 8. Of visible objects and hearing. 9. Of sounds and musicke. 10. Of singing birds, descending species, light. 11. Ingrate objects, and deafness, with other passages.

HAVING lighted lately upon two books, the one of Doctor Harvie's *De generatione animalium*, wherein he proves that all animals have their original from eggs ; which if true, then that is no fiction of the Poets, concerning Leda's two eggs, out of which were procreated Pollux and Helena, Castor and Clytemnestra ; but I conceive the Doctor in this, speaks rather tropically then properly ; for *simile non est idem*, and what may in some sort resemble an egge, is not an egge : however, his book is full of excellent learning and observation ; yet I have been bold in some things to dissent from him, as may be seen in the former Chapter



Chapter. The other book I lately viewed is, my Lord Bacon's Natural History, a Piece fraughted with much variety of elegant-learning, but yet wherein are divers passages that deserve animadversion; I never had leasure to run over the book till now, though I had seen it before, and now my distractions are such, that I cannot exactly examine it, but onely (*ut canis è nilo*) here and there touch a little. First then, I finde him mistaken in thinking that the French-pox is begot by eating of mans flesh: *Cent. 1. Sect. 26.* His reasons are, *A story of mans flesh barrell'd up like tunny, &c. eat at the siege of Naples; the other is, because the Canibals who feed on mans flesh are subject to that disease. 3. Because the blood or fat of mans flesh is mixed with poysons: And lastly, because Witches feed on mans flesh to aid their imaginations with high and foul vapors.* *Ans<sup>r</sup>.* These reasons are of small validity. For 1. it was not the eating of mans flesh at the siege of Naples that brought this disease into Europe, but it was procured by some of Columbus his Company, who had carnal commerce with foul Indian women, which with the pox they brought along with them. 2. Mans flesh of all other animals is counted the most temperate, therefore cannot produce such a venomous distemper so repugnant to mans body. 3. This is a peculiar disease of the Indians, both East and West; for divers Countries have their divers maladies. 4. Neither can this, or any disease be counted new in respect of their subjects, original causes, or seminaries, for this disease is as old as mans flesh, though in this part of the world it did not break out so generally as of late; and who knows but that the ancients had it, but under another name, being a kind of Leprosie. 5. The Canibals among the Indians are not more subject to this disease then others, who never tasted of mans flesh; for in all ages there have been men eaters, yet not tainted with this malady, and millions of latter years among us, who are infected with this poyson, and yet never eat of mans flesh. 6. It is against reason to imagine, that the flesh of a man should rather breed this disease, then of an ox or a sheep, seeing mans flesh is sooner convertible into nutriment, then of any other animal, because of the greater sympathy and specifical unity. 7. Though ignorant Indians do mix mans blood or fat with poyson, it will not therefore follow, that these are poysonable; no more then wine can be called poyson, because poysonable materials may be mixed with it: so we mix sugar and butter with rats bane, which we know have no venomous quality in them. 8. Witches, who are silly fools,



fools, may eat mans flesh, hoping thereby to aid their imaginations, but there is no such vertue in mans flesh as they conceive; so they use many spels, charms, and canting words, in which there is no more vertue then in a pibble stone, or a piece of rotten wood. 9. Mans flesh can afford no foul vapors, except it befoul it self, and putrified, and so indeed it may breed loathsome diseases, as all other corrupt and putrified meats do; which is done as it is corrupted, not as it is mans flesh; neither can it afford high vapors, except it were full of spirits, which cannot be in a piece of dead flesh; he that will have high vapors must drink sack, not eat mans flesh; the blood of the vine, not of the vein can breed high vapors. Indeed the drinking of mans blood, and eating of his flesh, may inure a man to cruelty, which Catelin knew by causing his associates to drink humane blood; hence the Judaical law forbids eating of blood at all, shewing us hereby, how much God abhors cruelty, or that which may induce a man to it.

II. His Lordship calls it, *A crude and ignorant speculation, to make the dilatation of the fire, the cause of the expulsion of the pellet out of the Gun; but he will have the cause to be the crude and windy spirits of nitre, dilated by heat, which bloweth abroad the flame, as an inward bellows.* But I would know what difference there is between dilatation, and between the flame and spirit of the nitre. He affirms dilatation to be the cause of this expulsion, therefore his exception against the former opinion was needless; and whereas he grants the flame to be the immediate expeller of the pellet, he unawares affirms what he rejects: neither can I see any difference between the flame of the nitre, and the spirit of the nitre inflamed, onely he was pleased to make shew of a new reason, by altering somewhat the words of the former, whereas the sense is one and the same, the speculation then is not crude, but the spirit of his nitre is crude, which without the flame can do nothing.

3. From a wax candle burning in a porringer full of spirit of wine set on fire, he infers (*Cent. 1. 31.*) strange conculsions. As 1. *That the flame of the candle becomes bigger and globular, and not in pyramis, and consequently that the pyramis of the flame is accidental.* I answer, the flame of the candle becomes bigger and globular accidentally, because the air about it is heated by the flame of the wine, therefore, as in all things like draws to like, so one flame dilates it self to enjoy the other; as a drop of water will contract it self upon a drie, but



dilate it self upon a wet table. 2. He infers ; *That the flame of it self would be round, if it were not for the air that quencheth the sides of it.* But I say that the air is so far from quenching, that it cherisheth and maintaineth the flame, without which it would quickly vanish, and that the flame would not be round of it self, if the air round about were not inflamed : for the same cause it rouls and turns, not of its own nature, but because the ambient flame draws it. 3. He infers hence, *That the celestial bodies are true fires, for they are globular, and have rotation, and have the colour and splendor of flame :* These are weak arguments that from common accidents prove specifical identities ; for if the stars be true fires, because globular, then we may infer that water drops are fire, because round, and that every thing which hath rotation is fire ; and if that be fire which hath the colour of fire, or that a flame which hath the splendor of flame ; we may say that rotten sticks, and glow-worms, or cats eyes are fire or flames, and if stars be flames, because in colour they are like to flames ; let us say that the Heaven is water, for in colour it is like water.

IV. It seems (saith he, Cent. 1. 45.) *that the parts of living creatures, that lie more inwards, nourish more then the outward flesh ; except it be the brain, which the spirits prey too much upon, to leave it any great vertue of nourishment.* This is not so, for experience shews the contrary, that the outward flesh of sheep, and so of other animals nourish more then the heart, lungs, liver, kidney, and spleen : Therefore Galen, (*l. de cibis.*) reckoneth these amongst his meats of bad juyce ; and indeed this stands with reason, for that nourisheth most which is easiest of concoction, and softest, and most abounding in benign and nutritive juyce, but such is the outward flesh, not the heart, kidney, &c. which are harder and drier, and not so apt to be converted into blood : It is true the Romans made much of the gooses liver, more to please their palate, then out of any good nutriment it offorded ; so they preferred moshromes and such like trash, to the best nutritive meates, as for the brains they are less nutritive then the flesh, not because the spirits prey upon them (for the animal spirits in the brain, do not prey more upon it, then the vital spirits do upon the heart, which notwithstanding, his lordship acknowledgeth to be more nourishing then the outward flesh, because more inward) but because the brain is less sanguineal then the flesh ; for those parts which they call spermatical, are less nutritive : what is more inward then the (*Spinalis medulla*) or pith in the back bone,



bone, on which the animal spirits do not prey, and yet it is little nutritive.

V. The first cause of cold (saith he, Cent. 73.) is a quick spirit inclosed in a cold body, as in nitre, in water colder then oyle, which hath a duller spirit, so snow is colder then water, because it hath more spirit; so some insects, which have the spirit of life, as snakes &c. are cold to the touch, so quick silver is the coldest of all mettals, because fullest of spirits. Answ. No spirit can be the cause of cold, for all spirits in vigitable animals produce heat, and are produced of heat, therefore we finde that where there are most spirits, there is least cold. 2. Nitre which is mentioned by the Ancients, is hot and not cold; and therefore both *Dioscorides*, *Pliny*, and *Galen* adscribe to it the qualities of heat, to cut, extenuat, discuss and purge gross and cold humors; and if that nitre which we use at this day, be not the same, yet it is not much unlike, (as *Mathiolus* shews) as having divers qualities of the old nitre; besides, it is a kinde of salt, and is begot of hot things, as pigeons dung, and the urins of animals, therefore *Brun. Seidelius* makes it hot. 3. I deny that water is colder then oyl, to the outward touching, for hot waters (as he said before) are in this regard cold, and if oyl hath a duller spirit then water, how comes it to mount upward, and swim above the water: sure this ascendant motion cannot produce from the earthy and gross substance, but from the quick spirits thereof; therefore we finde that water is cold, and oyl hot in operation, because more full of spirits then water. 4. I deny that snow is colder then water, because it hath more spirit; but because it is more condensed: for heat and cold are more active in a dense and solid, then in a thin attenuated substance; so ice is colder then water, and yet who will say that there is more spirits in the ice then in water; besides, the snow is colder then the water, because begot of colder winds, and in colder clymats. 5. I deny that insects are cold to the touch, for having in them the spirit of life; because they are colder when that spirit is gon, as we see in all dead bodies which are colder, then when they were alive; therefore death is called by the Poets (*frigida mors*) and (*gelidum frigus*) the spirit of life is that which is both begot of heat, and begets heat, and preserveth it; that when that spirit leave us, heat also forsakes us (*calor ossa relinquit*) saith the Poet; It is not therefore the spirit of life, but the temperament and constitution of the body of divers earthy and watrish animals, which argue cold; and we see that for this cause womens bodies are colder



then mens, and some men of colder constitutions then others, because they have fewer spirits, and more of earth and water in them. We know also how dull and stupid our hands are in cold frosts, till the spirits in them be quickned by heat. 6. I deny also that quicksilver is the coldest of metals, because fullest of spirits: for it is much doubted whether Mercury be cold at all; for agility proceeds from heat, not from cold, and such a quality became the messenger of *Jupiter*, by whom all things receive life and vigour. Indeed Mercury may be called the Monster of Nature; for sometimes it refrigerats, sometimes it califieth; it cures sometimes cold, sometimes hot diseases; take it hot, it produceth cold; take it cold, it produceth hot effects: and it hath this quality of heat, that nothing is more penetrating then it is. *Christopher Encelius* (*de re metalica*) makes it hot and moist in the fourth degree. *Quercitan* in his answer to *Aubert*, makes it rather aerial then aquiall; & we know that heat is one of the qualities of air. *Renodæus* (*in Pharmac.*) makes it both hot and cold. *Keckerman* (*in Sift. Phy.*) sayth, That it is hot, as it is full of spirits, but cold as these spirits are congealed. *Croclius* (*in Bas. Cly.*) prescribes it in defluxions of the head, and in hydropsies, which shews it is hot. And *Poterius* (*in Pharm. Spagir.*) tells us, That by reason of its different operations, no man can tell whether heat or cold be most predominant; but it is certain, saith he, that it is both: for is known by our senses that it is cold, it is known by its effects and operations that it is hot: for it cuts, attenuates, dissolves and purges, which are the effects of heat, and so his Lordship doth acknowledge in the next following leaf, That heat doth attenuate, and by atenuation, sendeth forth the spirit.

In his following discourses he hath phrases not to be tolerated in Philosophy, as when he saith (*Cent. 1. 80.*) That tangible bodies have an antipathy with air. Belike then the air is no tangible body; but experience shews the contrary, that air is tangible both actively and passively; our bodies are sensible enough of this tangibility, both in hot and cold weather. Again, if by tangible bodies he mean grosse and dense bodies, how can air have an antipathy with them, seeing air is one of the ingredients of which all mixed bodies are compounded? can it be contrary or antipatheticall to it selfe? He saith (*Seff. 91.*) That paper or wood oyled, last long moist, but wet with water dry or putrifie sooner, the cause is, for that air medleth little with the moisture of oyle. *Answ.* He should have told us the cause of this cause; for why doth not air medle with oyle as well as with



with water? The reason is, because oyle is a more tenacious and dense substance then water, and therefore resisteth the heat of the air longer, and cannot be so soon evaporated; and indeed it is not the air, but the heat in the air that works both on water and oyle; for the cold air drieth up neither, it may well harden them. Take then two papers, the one moistned with water, the other with oyle, and hold them near the fire, we shall see the one dried up long before the other, so that his saying is erroneous when he inferreth (*Se& 91.*) That fire worketh upon oyle as air upon water. For indeed the air doth not work upon water, but heat in the air or fire; nor doth the fire work so soon upon the oyle as on the water, when they are at a distance. Again, he saith, That white is a penurious colour, and where moisture is scant. *Answ.* There are many things which want moisture, and yet are black, as divers dry stones and coals; many bodies are not scant of moisture, and yet are white, as Lilies, Milk, Snow. There is as much moisture in a white Swan as in a black Raven. But when he saith (*Se& 93.*) That Birds and Horses by age turn white, and the gray hairs of men come by the same reason; he is mistaken: for it is not want or scant of moisture, but want of heat rather that is the cause of whitenesse: for old men abound more in watrish moisture then young men: and therefore we see that cold climats produce white complexions and skins, whereas they are black and swarthy in hot Countries. Snow is not bred in hot Summers, but in cold Winters; and hoar frost is ingendred in cold Scithia, not in hot Ethiopia. Again, he is mistaken when he saith, (*Se& 96, 97.*) That the soles of the feet have great affinity with the head and mouth of the stomach; so the wrists and hands have a sympathy with the heart. For there is no more affinity between these parts then any other; the feet have as great a sympathy with the heart, and the wrists with the head, as these with the heart and the other with the head. If there be any affinity between the head and the feet, it is by reason of the nerves; and so the same affinity may be to the hands. If there be any sympathy between the heart and the wrists, it is because of the arteries, and so the sympathy may be to the feet. It's true, that the heart is affected in Agues by things applied to the wrists; not because there is any sympathy between the skin, muscles, nerves and bones of the wrists with the heart; but because the arteries which have their originall from the heart, lie more open, and are more tangible there then in many other parts of the body; and yet in the temples, and divers other parts of



the body, you shall find the pulse as well as in the wrists, and things applied to these parts, will work as powerfully on the heart, as if applied to the wrists.

His Lordship is angry, (*Señ. 98.*) Because we call the spirits of Plants and living Creatures (*Soules*) such superficial speculations (saith he) they have. But he should for the same reason be angry with the Scriptures, which ordinarily calls the spirits of beasts, birds, and fishes (*Souls.*) He must also be angry with all wise Nomenclators, which have called living and sensitive creatures (*Animals*) because they have (*animal soules:*) For *animal* is from *anima.*) Again, I would know, if this word likes him not, how he will call these spirits of animals? If he call them nothing but spirits, then he makes no difference between them and all other tangible bodies: For, according to his doctrine, there are spirits in stocks and stones, as well as in plants and animals; but I hope the spirits of these deserve another name, then of the others; which indeed, according to the old and true Philosophy, are meer qualities: which word also he rejects as Logickall, as though forsooth Logick, or Logickall terms were needlesse, whereas no knowledge is more usefull and necessary, as being the hand-maid to all Sciences, the want of which hath occasioned multitudes of whimzicall conceits, and Chimera's in mens brains. Again, if he will not have these chiefe acts, agents, or movers in animals, to be called souls or spirits, but air, or vapour, or wind, he will find that all these three are called by the word (*Anima*) 1. Aire is *Anima* in the Prince of Poets, *Eclog. 6.*§

*Namq; canebat uti magnum pir inane coacta  
Semina, terrarumque, animæq; marisq; fuissent.*

2. Vapour is called (*anima*) too in the same Poet, (*Æn. 8.*) *Quantum ignes animæq; valent.* 3. The wind is (*anima*) also in *Horace:* *Impellunt animæ lintea Thracix:* and (*animus*) in the Poet, (*Æn. 1.*) *Mollitq; animos & temperat iras.* So then, call the Spirits of animals what you will, air, vapour, wind, or spirit, you will still find (*anima* or *soul*) is the term most proper for them, and that this is no superficial speculation.

My Lord in his second Century (*señ. 11.*) Makes pictures and shapes but secondary objects to the eye, but colours and order the things that are pleasing to the sight. If he had said, That colours are the chief objects of the eye, he had spoken more properly then to say, they are pleasing to the eye; for some colours are very dis-  
pleasin



pleasing to some eyes. As for order, that is not at all the object of the sight; for it is a relation, and relations incur not into the senses. Again, he saith (sect. 114.) *That the sense of hearing striketh the spirits more immediatly then the other senses.* This is a very improper saying; for the senses are patients in receiving the species of their objects, nor agents upon their objects. If there be any action of dijudication, that is the work of the phantasie rather then of the outward sense; and though I should yeeld that there were some actions of the eye, yet the sense of hearing is meerly passive, and therefore it is not the sense of hearing that striketh the spirits, but the species of the sound which is received by the spirit in the auditory nerve, and so conveyed into the phantasie: so it is not the smelling (as he saith) that worketh on the spirits, but the object that worketh on the sense of smelling. Again, when he saith, (sect. 117.) *That dores in fair weather give no sound;* he speakes by contraries: for if by fair weather he means dry weather, then dores give the greatest sound. I know not what kind of dores his were, but mine sound much in dry Summers, and but little in moist weather. And this stands with reason; for the humidity of the air must needs moisten the hinges, & consequently hinder their sound. Neither is it true which he saith of bullets, (sect. 120.) *That they in piercing through the air make no noyse:* For Souldiers will tell him the contrary, that many times they hear the whistling of the bullets over their heads. So darts and stones flung with violence in the air, make a sound, as the Poet sheweth:

*Sonitum dat stridula cornu, & auras certa secat.*

And his reason is no lesse infirm then his observation, to wit, That the extream violence or swiftnesse of the motion should hinder the sound, whereas nothing furthers the noyse so much as the swiftnesse of motion. Again, he is mistaken in our definition of sounds, when he makes us say, *That it is an elision of the air, which is a term of ignorance.* (sect. 124.) So it is indeed, but in him, not in the Philosophers, who doe not call sound an elision of the air, but the collisian of two hard or solid bodies in the air. And no lesse is he mistaken when he saith, *That Sounds are generated where there is no air at all.* This he can never prove, for even in the water, and in the flame (wherein he saith sounds are generated) there is air; and if it were not for air, the sound should never be caried to our ear; and therefore the instance he makes (f. 133.) of knapping a pair of tongs within the water, which we can hear, and yet there is no air at all present,



is to no purpose ; for there is air present, both in the water, and besides nothing but air from the superficies of the water to our ear, by which *medium* the sound is conveyed to us. He gives us a strange reason (Sect. 143.) why we hear better in the night than in the day, *Because in the day the air is more thin, and the sound pierceth better, but when the air is more thick, the sound spreadeth abroad lesse.* Indeed by this reason we should hear better by day ; for the thinnesse of the air, and the easie piercing of the sound, are main helps to hearing, whereas the thicknesse of the air is a hinderance : Therefore *Hippocrates* in his Aphorismes observeth truly, That when the wind is Southerly, and the air thick, our hearing is heavy. We hear better when the wind is Northerly, and the air clear. It is not therefore the thicknesse of the air, but the silence of the night which helpeth hearing, as the Poet saith,

*Tunc silens omnis ager, pecudes, pi&aq; volucres. Æn. 4.*  
And then it is when every sound, though never so small, affrights and excites him.

*Tunc omnes terrent aura, sonus excitat omnis. Æn. 2.*  
In his third Century (Sect. 201) he tells us, That though there be a wall between, we can hear the voyce one this side which is spoken on the other, not because the sound passeth through the wall, but archeth over the wall. But here he contradicteth himself in his former Century (Sect. 154) when he saith, *It is certain that the voyce doth passe thorow hard and solid bodies.* The voyce then may passe through a wall, and not over it : And how can it passe over that wall which is continually with the feeling or roose of the House ? For in a close chamber I can heare the voyce of him that is in the next room, though there be a wall between us, and the room sieled or roofed. But he saith (Sect. 213.) That the spirit of the hard body doth cooperate. I would know what spirits there are in a stone or brick wall, or in a wall of mud to cooperate ? If there be such cooperating spirits, it will follow, That where are greatest numbers of them, there will be most help, and the sound better heard ; but in a thick stone wall there are more spirits (because more stones, every stone having his own spirit) then in a thin mud, woodden, or brick wall, and therefore the sound must be better heard through a thick then a thin wall, there being so many pneumaticall co-operators, all helping to carry the sound. This is Philosophy that passeth all understanding. He saith (Sect. 235.) *It is manifest that between sleeping and waking (when all the senses are bound and suspended) musick is farre sweeter then when one is fully waking.*  
All



All the senses are not bound when a man is between sleeping and waking; but when a man is in dead sleep, then are all the senses bound: If then they are all bound, and likewise all are bound between sleeping and waking, what difference will he make between the extreame and the medium, between a dead sleep, and that which is betwixt sleeping and waking. Again, how can musick be sweet to him in whom all the senses are bound up? Which way shall the musick enter? Can he heare without hearing? Doubtlesse the delight he hath in the Musick doth shew all his senses are not bound up. He shews, (238, 239.) That *Parrets, Pies, Jayes, Dawes and Ravens, are singing birds, and that this aptnesse of singing is in their attention.* He should have added Thrushes and Stares to his singing birds; but it is not attention which is the cause of their singing; for beasts and other birds may have as much attention, but its natural for birds to sing, and their speaking is but a kind of singing, for singing is the musick of the throat, and speaking the musick of the tongue: it is easie for those who exercise their throats and tongues in singing, to be brought to utter words by the same organs. *It may be (saith he, 205) the spirituall species of visible things and sounds, do move better downwards then upwards. Those on the top of Pauls seem much lesse then they are, but to men above, those below seem nothing so much lessened. So knots in gardens shew best from an upper window.* These examples thwart his (may be) for if the species move better downward, how comes it that we see the object better from the top of Pauls, then from the street looking upward to the top? Doubtlesse it is because the visible species of the things seen below, move better upward, as being more naturall both for the air which is a light body, and for the species which hath no gravity in it. Hence it is, that when wee stand below, we cannot so clearly discern the just magnitude of the men upon the top of Pauls, because the species must come from that high object to our eye downward, which is not so natural. The same may be said of the audible species; for sounds are better heard by those who are in high rooms, then by those who are below: and so they that sit in Church galleries, which are above the Pulpit, hear better then they who sit below in the pews. He speaks against experience when he saith, *There is a greater degree from the privative to the active, that is, from darknesse to light, then from lesse light to more light.* For when the day breaks I cannot see to read in the first degree of light, which is from darknesse; but in the other degree which is from lesse light to more, I can see to read, therefore this degree of  
lesse



lesse light to more light, as far greater then the other, which was from the privative to the active.

He tells us (270) That in visibles there are not found objects so odious and ingrate to the sense, as in audibles; thus the grating of a Saw sets the teeth on edge. That there are visible objects more ingrate to the eye then audible to the ear, is plain by experience, in such as have swoounded and fallen suddenly dead at the sight of some objects; some will sweat and fall into strange passions at the sight of a Cat, others at other sights. Pompey's wife fell into a swoound when she saw her husbands coat besprinkled with blood, Mark Antonies speech did not so forcibly work upon the Romans as the sight of Cæsars bloody garment, to prosecute his murtherers. The phantasie is much more affected by the eye then by the ear. As for the grating of a Saw, by which some mens teeth are set on edge, will not prove what he aimes at, but onely that the teeth are thus affected by reason of that nerve of the fifth conjugation, which sendeth one branch to the ear, and another to the larinx and tongue; as likewise there is a cartaligenous passage between the ear and palat, by which the air received by the mouth, is communicated to the ear. Hence we stop our breath when we will hear attentively, and violent sounds are evacuated by that passage which are received by the ear. But when he saith (276) That there is no effect of deafnesse found in Canoniers, and such like; he is again mistaken: For it is known that divers have lost their hearing by the noyse of Cannous, and other violent sounds. I knew one who grew deaf by being present at a Muster where many Muskets were discharged. Again, hee saith (277.) That when a Skreen is put between the candle and the eye, the light is seen on the paper whereon one writeth, where the body of the flame is not seen. But indeed neither the flame is seen, because of the Skreen, nor the light on the paper, but the paper by the light: for light is not the object which we see, but by which we see; it actuates the medium, and makes the object visible.



CHAP. V.

*The Lord Bacons opinions refuted. Of holding the breath when wee hearken. Of time. Of long life. Of making gold. Of starres. Of oyl. Of indisposition to motion. Of death, diseases and putrifaction. Of stuttering. Of motion after the head is off. Of sympathies and antipathies of the Vine and Colewort, the Fig-tree and Rew. Of white colour. Of the Oke bough in the earth. Of transmutation of species. Of Incubus. Of grain in cold Countries. Of determination and figures. Of accretion and alimentation. Of the period of life. Of sugar, leaves, roots, snow, and putrifaction.*

**W**E have shewed out of Anatomy, why we hold our 283  
breath when we hearken attentively; but my Lord 284  
gives a reason no way satisfactory: For (saith he) the cause is, for  
that in all expiration the motion is outward, and therefore rather dri-  
veth away the voyce then draweth it. His Lordship sayes well if  
we did hear by the mouth; but withall he should have confi-  
dered, that in breathing there is inspiration as well as expirati-  
on, and we hold our breath in hearing attentively, that there  
may be no inspiration as well as expiration. And indeed it  
must be a very weak voyce that our breath in expiration drives  
away. The true cause then as we have shewed, is the free pas-  
sage of the air between the mouth and ear by means of the pipe  
or chanell we mentioned; therefore we stay our breath rather  
from inspiration then expiration, lest the drum in the ear be  
extended too much with air. He saith, *It conduceth to long life* 292  
*that mens actions be free and voluntary.* If this were so, the abso-  
lute Monarchs of the world, whose words and commands are  
laws, and who have none to controll them, should be longer  
lived then their subjects, who are forced to doe many things a-  
gainst their liking, though not against their will; for all mens  
actions otherwise are free and voluntary, because they are men,  
but many times we see slaves live longer then Princes. He tells  
us, *That time and heat are fellows in many effects; for they both are* 294  
*airy and liquifie.* Time and heat cannot be fellows in effects, be-  
cause time is no agent, it doth not operate at all, quantities  
work not, though all things are produced in time; so hony and  
sugar grow liquid, clay and roots grow dry in time, but not by  
time. These effects are produced by the heat, drinesse and  
moisture of the aire, so that sugar waxeth not more liquid by  
age, but by the air: for keep it twenty years, it will harden or  
soften according to the weather. So it is not time that harde-  
neth the crum of bread, but the heat of the air by drawing in  
sensibly



insensibly its humidity: and therefore it is rather Poetically spoken then Philosophically, to say that time hardeneth or softneth, produceth or destroyeth. This indeed is to put the syth into *Saturns* hand, and to make him the father and devourer of his own children. He alledgeth one cause, *why women live longer then men, because they stir lesse*. But I say that men live longer then women, because they stir more: For by exercise the blood is warmed, the pores are opened, vapours are expelled, concoction is helped, the limbs and joynts are strengthened, the naturall heat is excited, the spirits and humours are refined. All ages shew us, that no women have ever reached to the age of some men; and it stands with reason that men should be longer lived. because they abound more in naturall heat, which is the cause why the Northern people are longer lived then the Southern. And I have observed, that in the Northern parts women are more given to exercise then in the countries farther South; and therefore are longer lived there then here. And my Lord himselve acknowledgeth, That exercise hindreth putrifaction, and rest furthers it. Therefore it follows, that men who exercise live longest, because they are furthest from putrifaction.

326 He judgeth the work of making gold possible. So have all they who have made shipwrack of their estates upon that stone, which hath proved no lesse dangerous then the rocks of *Malea*. It is not enough to judge the possibility, but it must be proved either by reason or experience, neither of which hath been yet done. For that factitious, or rather fictitious gold the Chymists brag of, is as far from true gold, as a painted fire is from a reall; for neither can it endure the fire, nor comfort the heart, nor hath it any of the qualities or essentiall properties of true gold, I am of *Scaligers* opinion, that it is as easie to change a beast into a man, as to convert any other metall into gold, which were to introduce by Art a specificall form into the matter, which is the work of Nature alone. He saith, It is a vain opinion to think the starre is the denser part of his Orb. 354 This is spoken both Lordly and majesterially: but he had done well to tell us why this opinion is vain, and to have delivered an opinion void of vanity, which he doth not; but his bare word is not sufficient to make this a vain opinion, which the learned of so many Ages have approved, and stands so much with reason. I confesse we know but little of those quintessentiall natures; for we are, as the Poet saith,

*Curvæ in terris animæ, & cœlestium inanes;*

Yet



Yet of all opinions this is most consonant to reason, that the starre is homogeneall with its spheare, so that the starre is the heaven contracted, and the heaven in which the starre moveth, is the starre dilated; for otherwise wee must make the heaven an heterogeneall body, and consequently organically, which will prove the vainer opinion of the two. He tells us, That *Oyle is almost nothing else but water digested.* I may say it is 359 any thing else rather than water, from which it is so averse, that it will not be united or incorporated with it: and the effects are clean opposite, for water is cold, oyle hot in operation; water putrifieth, oyle resisteth putrification; water makes Iron rust, oyle keeps it from rusting; water quencherh the fire, oyle kindles and feeds it; water is heavy, oyle light, for it vvill still be uppermost; vvater is thin, oyle thick; water is quickly up by heat, and turned into vapours, so is not oyle; water is the food of plants, oyle of men; oyle is apt to be inflamed, so is not water: therefore oyle is rather air or fire then vvater digested.

He gives us a strange cause of mans indisposition to motion 381 when Southern winds blow. *The cause (saith he) is, that the humours do melt, and wax fluid, and so flow into the parts.* How humours should melt, I know not, except they were congealed like butter, wax, or ice: and where be the parts into which they flow, he tells us not: but indeed the true cause is, the giving (as we call it) or relaxation of the muscles, nerves, and tendons by the warm and moist air which in dry and cold weather are more firm compacted and united; and therefore the apter for motion. *It is (saith he) commonly seen, that more 382 are sick in Summer, and more die in Winter.* This is to me a Riddle; for if more die in Winter then in Summer, it must follow, That more are sick in Winter then in Summer; for men usually die not till they be sick, and so he contradicts himselfe. Much like to this is that saying of his, *Diseases are bred chiefly by heat; the contrary whereof is apparent, that multitudes of diseases are bread by cold; neither can I yeeld to him in saying, That it is a superficial ground, that heat and moisture 383 cause putrification, because there have been great plagues in dry years.* But by his Lordships leave, the plagues were not bred by the drynesse of the yeare, but by the precedent heat and moisture of the Winter, or Spring, which break out upon the hot and dry Summer, or Autumne, and this hee acknowledgeth in his next Section, where he sheweth, That the cause of diseases is 384 falsly imputed to the constitution of the air at that time when they break



break forth, whereas it proceeds from a precedent sequence and series of the seasons of the year; and so when he saith, That in Barbary their plagues break up in Summer when the weather is hot and dry: If this be so, then it is no superficial ground to say that heat and moisture cause putrefaction, seeing it is resisted by hot and dry weather, and indeed it were absurd to think otherways, seeing both experience and reason tells us, that heat and moisture are the breeders of putrefaction, and that frigidity and siccity are its greatest enemies; therefore in cold climats and seasons putrefaction is not so frequent, as in hot Countries, and Summers; so he confesseth, that the Country about Cap Verde is pestilent through moisture; neither are drie things so apt to putrefie as moist, so the flesh putrifieth and not the bones; the apple or the pear will putrefie, when the seed within remains unputrified: whereas those bodies which have little or no moisture, resist putrefaction both in themselves and others, as Salt, Brimstone, Myrrhe, Aloes, and such like.

386

He makes Refrigeration of the tongues the cause of stuttering. If this were so, then old men should stutter more then young men; for old men are colder. But we know the contrary, that not the coldness, but rather the over-heating of the tongue causeth stuttering, and this he acknowledgeth in the same Section, that many stutterers are very cholerick men. But choler is hot, then it seemes that both heat and cold is the cause of stuttering. But indeed the true cause in some is a bad habit or custom contracted from their infancy, in others eagerness of disposition; for hasty and eager natures usually stutter, and whilst they make the more haste, they use the lesse speed; in others again stuttering proceeds from some infirmity or impediment in the tendon, muscles, or nerves of the tongue. As for drinking of wine moderately, which he saith, will cause men stut lesse, is a thing I could never yet observe in those stutterers I have bin acquainted with.

400

He saith, That men and beasts move little after their headss are off, but in birds the motion remains longer, because the spirit are chiefly in the head & brain, which in men & beasts are large, but birds have smal heads, therefore the spirits are more dispersed in the sinewes. That the spirits are chiefly in the head & brain, I deny; for the vital spirits are chiefly in the heart. And if the spirits be chiefly in the head and brain, why doth the body separated from the head, move more and longer time then the head? Again, though birds have lesser heads then men and beasts, yet they have heads proportioned to their bodies, and the spirits proportionably are as much in their heads, as in mens or beasts heads.

More-



Moreover, though some men and beasts move little after the head is off, yet some move much: for I saw one beheaded, whose body after it was laid in the coffin, and carried a pretty way from the place of execution, with a violent fit of motion, was like to beat the coffin out of the hands of the bearers; therefore the true causes of this difference are these, as I conceive, 1. The spirits of birds are more aeriall and fervent then of men and beasts, and in some more, in some lesse; therefore the body of a Cock beheaded will flutter more then of a Goose, or Turkie; and so in beasts, a Cat beheaded will move more violently, then of many others: for this reason some men move more then others. 2. The capacity of the vessels may be the cause of this differance; for in men and beasts the veins, arteries, and nerves, wherein the spirits and blood are contained, be larger then in birds, and therefore in them is a more sudden eruption of the blood & spirits, and consequently a shorter motion then in birds. 3. The weight of the bodies in men and beasts farre exceed the weight of birds bodies, and therefore are not so apt to be moved.

His Lordship is pleased to call *The opinions of sympathies and antipathies ignorant and idle conceits, and a forsaking of the true indications of causes, Felix qui potuit rerum cognoscere causas*, God will have us in some things, rather admire his wisdom, then know his secrets; and because we cannot attain the true reason of many things, we are to submit our judgments to a reverend admiration of his goodness: who can give the reason of that sympathy between the loadstone and the iron? Between the same stone and the pole? We see there is a sympathy between some simples and some humors, and between some parts of our bodies and some drugs. What other reason properly can be given, why Faltick draws choler, Agaric flegm, Epithymum melancholy? Why Selenites, as *Fernelius* observeth, being applied to the skin, stayeth bleeding? Why should Cantharides work onely on the bladder? Why doeth Hemlock and Henbane poyson men, which nourish birds? How do cats come to the knowledge of Nip, and dogs of grasse? who taught the Chicken to fear the Kite, or the Lamb the Wolfe? And why have some men strong Antipathies with some meats? Why are some sounds, some smells, some sights grateful to us, some again odious? If there be no sympathies and antipathies why are water and fire so averse to each other? The Vine will not prosper if the Colewort grow near it, he gives a reason for this, *Because the Colewort draweth the fattest juyce of the earth, and*  
where



where two plants draw the same juyce their neighbourhood hurteth. This reason may be as well rejected as admitted; for other plants that are set neare and among Cole-worts, fare not the worse for their vicinity, except it be Rue: and not onely doth this Antipathy last between the Vine and Colewort when they are alive, but when they are dead, and separated from the earth: for they write that Coleworts hinder inebriation, and suffer not the wine to fume into the head; and why is not the vine as strong to draw its nourishment from the earth as the Colewort, seeing it hath more spirits, and extends it selfe to a greater circuit and height? But when he saith, That Rue being set by a Figtree, becometh stronger, because the one draweth juyce fit to result sweet, the other bitter. I would know how one and the same piece of earth can afford sweet juyce to the one, & bitter to the other at the same time: and how the fetide juyce of the earth goeth into the Garlick, and the odorate into the Rose when they grow together. Sure these are whimzies, for no piece of earth can have so many contrary qualities at the same time, nor can there be severall juyces in one bud as he saith afterward; neither is the earth any thing else but the common matrix of the plants, affording them moisture and nourishment, which my Lord acknowledgeth proceeds rather from the water then from the earth, when he saith, That white Satyrion bean flowers, &c. are very succubent, and need to be scanted in their nourishment; he contradicts his former assertion when he said, That white was a penurious colour, and where moisture is scant: And yet he saith, That white plumbs are the worst, because they are over-watry: So it seems that white is both a penurious and a super-plentifull colour, where moisture is scant, and yet over-watry.

The opinion that an Oke bough put into the earth, will put forth wild Vines, is rejected by him, upon this ground, It is not the Oke (saith hee) that turneth into a Vine; but the Oke bough putrifying, qualifieth the earth to put forth a vine of it selfe. If the earth could put forth a vine of it selfe, what need it to be qualified by the putrified Oke bough? If it be of the putrified Oke bough (as doubtlesse it is) that the vine is generated, then the earth doth not of it selfe send forth the vine. It is naturall for one thing to be generated out of the corruption of another; but for plants to be generated of the earth alone, without either seed, boughes, or some putrified materials of other things, were miraculous. He saith, That transmutation of species is in the vulgar Philosophy pronounced impossible, but



but this opinion is to be rejected. What he means by vulgar Philosophy, I know not, but this I know, that the Philosophy: which is vulgarly received by all learned and wise men, hold the transmutation of species impossible: not to God, who could transform *Lots* wife into salt, *Nebuchadnezzar* into a beast, waters into blood, a rod into a serpent, and water into wine, but to Art or Nature which cannot transform species, whether we understand the word in the extent and universality, or as it may signifie the individuall nature under such a species: For every individual consists of a matter and a forme, the whole composition cannot be transformed into another composition, nor the form to another specificall form, nor the matter into another matter: not the first; for generation is not the changing of one composition into another, but an introduction of a new form into the matter: not the second, for one form alwayes perisheth by corruption upon the introduction of another by generation: not the third; for the matter which is the common subject of all mutations, must be alwayes the same in substance, though it receive some alterations in qualities. Transmutation then of species is impossible to Nature, not to Chymists, who think to transform silver into gold: not to the Roman Church, which holds a transubstantiation of bread into Christs body: not unto Poets, who sing of so many metamorphoses and transformations of men into beasts: nor of those who think Witches can transform themselves into Cats, Hares, and other creatures. He tells us, That *Mushrooms* cause the accident which we call *Incubus*, or the *Mare* in the stomach. If this were true, in *Italy* and *Africa*, where these are ordinarily eaten, this disease would reign most: but we find that the Northern Countries are more subject to the *Incubus* then the Southern. Many then eat *Mushrooms* who never were troubled with this disease, many are troubled with it who never eat them. But indeed the *Incubus*, or *Mare*, is no disease of the stomach, as he saith, but of the *Diaphragma* and lungs, which being oppressed by a thick flegme or melancholy, send up gross vapours into the throat, by which speech is hindred, and into the brain by which the imagination is disturbed.

It is reported (saith he) that grain out of the hotter Countries 575 translated into the colder, will be more forward then the ordinary grain of the cold Country. This is known to be untrue by divers grains transplanted hither into this cold climat, and by the grains translated hence into the *Orcades*, and other cold parts. Again, he saith, That plants are all figurate and determinate, which



inanimat bodies are not] if this be so, then inanimat bodies are  
 infinit, for certainly vvhatsoeuer is finit, hath its terminations;  
 and figure is nothing else but the disposition of terminations;  
 even water is figurat, because it is finit, though it assumeth  
 the figure of the continent body in vvhich it is. To say then  
 that a stone is finit, and yet not figurat nor determinat, is a plain  
 contradiction; a dead carcass is an inanimat body, & yet retains  
 the same figure & termination, vvhich it had vvhilst it vvas ani-  
 600 mat. In this same Section he tels us [that plants do nourish, inani-  
 mat bodys do not, they have an accretion, but no alimentation] but how  
 any thing can have an accretion vvitout alimentation is to me  
 a riddle: I speak of proper and Physicall accretion, which is an  
 extension of all the parts by an internall principle or soule  
 converting the aliment into the substance of the body nourish-  
 ed. For that accretion of stones, and other inanimate things,  
 is an apposition of externall matter, not an extension of the  
 parts by an internall agent, converting the nutriment into the  
 thing nourished. And how can stones, or such hard bodies have  
 extension, whereas they want humidity, which is the cause of  
 extension. Besides, accretion is a supply of deperdition; for  
 where there is diminution of parts, by means of the heat ex-  
 hausting the radicall moisture, there must be restauration by  
 nutriment, and consequently accretion. Therefore there maybe  
 an outward agglutination or aggregation of stones without ali-  
 602 mentation; but an accretion properly so called, there cannot  
 be. Lastly, he tells us in the same Section, That *Plants have a  
 period of life, which inanimate bodies have not.* If inanimate bo-  
 dies have a life, and no period, then they are immortall like  
 the Angels, and so the stones we tread on in the dirty streets,  
 are in better condition then the great Monarcks of the world.  
 Again, if plants have a period of life, they have life, and conse-  
 quently are living creatures; and yet shortly after my Lord di-  
 stinguisheth them from living creatures in divers respects,  
 607 [Sugar (saith he) to the Ancients was scarce known, and little  
 used] Sugar was both known to, and used by the Ancients; for  
 that which they called *mel arundineum*, hony of the cane was  
 much used in Physick: they called it also *Indian salt*, because  
 it was like salt in colour and consistence, when it was harden'd  
 by the Sun: the other kinde of Sugar the Ancients knew and  
 used as well as wee; only they made it by pressing, we by boy-  
 ling of the canes, which kinde of boyling they used not, as we  
 do, because they sweetned their water by steeping the canes in  
 them, and that was their drink: of this drink, *Lucan (lib. 3.)*  
 speaks,



speaks, *Quiq; bibunt tenerâ dulces ab arundine succos.* And that they used sometimes to boil the Sugar canes, is plain by *Strabo* (lib. 35.) & likewise by *Statius* (l. 1. Syl.) *Et quâs præcoquit eboisa cannas.* [Seeds and Roots (saith he) are chiefly for nourishment, but leaves give no nourishment at all, or very little] this is not so, for the leaves of cabbages, coleworts, lettice, and such like, give the nourishment, and not the roots; there is more nourishment in the leaves of one cabbage, then in a hundred cabbage roots. He gives us a bad definition of snow, when he calls it [the froth of the cloudy waters] froth is æreal, snow is watrish, froth is hot, snow cold, froth is light, snow heavy, because more terrestrial; indeed in colour snow is like froth, hence *Scaliger* saith, that snow is almost froth. Poetical Phylosophie discriminates froth from snow, in making *Venus* the daughter of the one, not of the other, snow then is not the froth of cloudie waters, though *Pliny* so calls it, but it is the thin and rarified vapours of the watrish cloudes, united into those white flakes we see, by cold; snow then is not begot immediately of water, as froth is, but of cold and thin vapours: Why he should call [putrification the subtillest of all motions] I cannot conceive, for what more subtilty is there in putrification that is a kinde of corruption, then in generation, the one consisting in the deperdt-ion of the old form, the other in the acquisition of a new form; neither doth he speak Philosophically, vwhen he calls it a motion, for indeed putrification is a mutation, and no motion, because both the *termini à quo* and *ad quem*, are not positive, as they are in all motions.

CHAP. VI.

The Lord Bacons opinions confuted concerning Snow, Ephemera, gravitie, the sperme of Drunkards, putrification, teeth, bones and nails, thick and thin mediums, Nilus, hot Iron, brein, sudden darkness, drie and moist bodies, fish, cornes, hunger, liquifaction, hardness, moisture, accidents, light, right side, spungy bodies, stone-walls, imagination, the cramp, hedghog, mummy, salt, Cominus and others refuted concerning motion, qualities, colours, forms, the Epilogue.

MY Lord thinks [that there is in snow a secret warmth, because the Ancients have observed worms bred in old snow] but I am of another opinion (though *Scaliger* seems to favour my Lords  
S 2 tenet)



tenets) that neither the snow is warme, nor do these worms breed in snow; our senses tell us there is no heat in snow; and where there is no heat, there can be no putrification nor generation; the worms then are bred in the ground under the snow, but not of the snow, which is not warme, but keeps in the warmth of the earth, and defends it, as it were a mantle from the piercing air, therefore in great snowes, sheep will live longer under the snow then above in the sharp air. And whereas the worm dieth when it comes out of the snow, this proceeds not (as he saith) from the exhaling of the worms spirits, which was shut in by the cold, but rather from the chilling of that spirit which was kept in by heat: for whilst it was under the snow, the worm was kept warm from the piercing air which now kils it. He saith, That the flies called *Ephemera*, live but a day, the cause is the exility of the spirits, or perhaps the absence of the Sun. But neither of these is the cause: not the exility of spirit; for we see that among men they that have weak and attenuated spirits, live longer then they who have more strong, dense, and more plenty of spirits, and so in other creatures, a Horse, or Bull, are not so long lived as a Crow, or Raven, which have more exility of spirit. The cause therefore of short and long life, is the goodnesse or badnesse of the crasis and temperament of the radical moisture, and its due or undue proportion with the natural heat, the symmarie or assymetrie of the four humours, and first qualities, and the conformity of the organs. As for the Suns absence, that cannot be a cause of short life: For, 1. the Sun is never absent in his vertue, efficacy, and influence. 2. Many creatures prosper best in shades, as plants. 3. In those Northern parts where the body and light of the Sun is not seen in many moneths together, yet multitudes of creatures are generated and live there. 4. It seems that the *Ephemera* are hurt rather by the Suns presence then absence: for *Scaliger* writes (*Exer. 194. 5.*) That those *Ephemera* flies which he had seen, were always to be seen in the evening, never at the Sun rising, and one of them which he had caught, lived all night, but died in the morning. The Suns presence then rather then his absence, is the cause of this short life in the flye.

704 He saith, That the motion of gravity is a meer motion of the matter, and hath no affinity with the form. If it be so, what use is there of the form? the form of every thing is the nature thereof, and nature, as the Philosopher tells us, is the principle and cause of motion: the matter is but the passive, the motion is the active principle of motion. When he tells us, That over moisture doth some-



somewhat extinguish the heat, as hot water quencheth the fire: he speaks not like a Philosopher; for there is not Physicall action but where there is a contrariety: now there is no contrariety between moisture and heat, but between moisture and driness, heat and cold: therefore the humidity of the warm water works upon the ficcidity of the fire, and not upon its heat. For if the one quality be taken away, the other will fail. Neither doth his Lordship speak like a Philosopher when he saith, That the sperm of drunken men is unfruitfull, because over moistned. Lot, who 723 in his drunkenness got both his daughters with child of boyes, can shew him the contrary, and so can the Comick when he saith, *Sine Cerere & libero friget Venus.* The Poets knew this vwhen they made Bacchus armour-bearer to Venus, and a continuall companion of the Fauns and Satyrs. And the Gentiles that still offered vvine in the sacrifices of Venus, as I have shewed elsewhere (In *Mystagogo.*) Neither is the sperm over-moistned, as he saith; for the drunkards vvine cannot get presently into the sperm to moisten it, vvwhich requireth time for elaboration in the spermatieall vessels. Neither can I approve of his reason when he saith, That Caterpillers breed upon Cabbages, because they have fat leaves, and apt to putrifie. This contradicts his former assertion, That the viscy substance of plants is most in the roots, and the vvatrish in the leaves, vvwhich is the cause that the root is more nutritive then the leaves. Neither doth farnesse make a thing apt to putrifie, but rather resisteth it: it is the watrish moisture that is most apt to putrifie, especially being mixed with a grosse and earthy substance.

He tells us, That bones and teeth stand at a stay, as for nails they grow continually. This is not so: for nature hath prefixed certain limits of growth to every thing, which when it hath attained, rests there: nails then if they be not pared, will grow to their prefixed length, and there stay; but if they be kept pared, they will grow, still aiming at their just magnitude, which by paring them often, we hinder. Hence it is that they are still growing, because still pared; so doe the hairs of our head and beards, and so do hedges and trees that are pruned. 748

He knoweth not how the eye worketh when it is placed in the grosser medium, and the object in the finer. This is easily known; 761 for if ever he had been in a mist, he should have found that his eye being in the grosser medium, could not well apprehend the object that was in the finer, though the object be celestiall luminaries, and so it is with those that are in the water, they cannot see the object that is in the aire, so well as they who be-



ing in the air, behold the object in the water, because the distance of the thicker *medium* from the eye dilateth the object, which is contracted and made obscure if the eye be in the thicker *medium*: for how can the species be received into the eye, if the *medium* that should convey it, hindereth it? The cause why it raineth not in *Ægypt* (saith he) is, For that *Nilus* hath a longer race, and runneth swifter, for such waters vapour not so much as standing waters; or else there is a better concoction of that water; for waters concocted vapour not so much as raw. Besides, the air there is thin and thirsty, and imbibeth the moisture, and suffereth it not to remain in vapours. Here are divers causes alledged, but none of them satisfactory: For, 1. there be rivers that have as long a race, and run swifter, which hinder not rain. 2. If standing waters breed vapours, then *Nilus* should, when it stands 40 dayes together over *Ægypt*. I deny that concocted waters breeds fewer vapours then raw waters: for water over the fire will never cease to vapour, till it be all spent, and converted into vapours. 4. The air of *Ægypt* is not so thin and thirsty as under the Line, and yet there it raineth. 5. The true cause then why it raineth not in *Ægypt* is, because God and Nature doe nothing in vain; but rain had been in vain and needlesse in *Ægypt*, whereas *Nile* supplieth the effects thereof, therefore by the Poet *Nilus* is called, *Jupiter Ægyptius*.

My Lord speaketh against manifest experience when he writes, That Iron red hot burneth and consumeth not. That was the priviledge onely of the fire-bush which *Moses* saw. We know that the fire by degrees wasteth the Iron, and Steel also, which is a harder metall. But he saith, That the increasing of the weight of the water will increase his power of bearing, as broin when it is salt enough will bear an egge. In twenty gallons of water an egge will sink as well as in one, so as the increasing of the weight is no-thing, but it is the thickning of the water with salt that maketh it strong to bear. So we see men in boats are better supported in Sea-water then in fresh. How sight, as hee saith, coming into sudden darknes, should induce an offer to shiver, is a strange *Ænigma*; for the sight in darknesse can neither act nor suffer, as having no object nor visive species. It is not the sight then, but the imagination upon the sudden change apprehending danger, that causeth the shivering. Water (he saith) by a kind of appetite, or thirst, receiveth dry bodies, and so dry bodies drink in waters and liquors. It vvere strange that contraries should have an appetite or thirst to each other. It were against nature, *simile simili gaudet*, like draws to like, and contraries shun each other.



other. Hence it is, that vvater vvill not spread it selfe so soon on a dry board as on a wet: upon a dry board a drop of vvater vvill contract it self into a globular form, and rise into some height, rather then joyn it selfe to its enemy; whereas upon a vvet board it presently spreads it selfe: So dry things will rather swim upon, then sink in the vvater, except their vveight force them downward. He also contradicteth experience when he saith, That *Fish hating the dry will not approach the air till it grow moist.* For vve see that fish play most upon the top of the vvaters in hot and dry Summers, and in the hottest and driest time of the day, when the Sun is in his Meridian. So when he saith, That *Aches and Corns engrieve most towards rain or frost.* This is not as if they were sensible of future rain, but because the extremity of heat and cold doe exasperate these infirmities. For the same reason Moals vvork, and Fleas bite more eagerly. He tells, That *hunger is an emptinesse.* But this is not so; for there is sometimes hunger without emptinesse, and sometimes emptinesse without hunger. It is therefore not emptinesse, but *ἐπιθυμία θερμῆ καὶ ξηρῶν*, as the Philosopher tells us, a desire or appetite of hot and dry things, caused by the corrugation and sucking in the mouth of the stomach.

His Lordship is pleased to call the received opinion, That *putrifaction is caused by cold, or preternaturall heat, but nugation.* But if cold be not the cause of putrifaction, how comes it that Apples and Cabbages doe rot in frosty vveather? And if peregrine heat be not the cause, how comes it that in hot and moist years and places, pestilentiall Feavers, and other putrid diseases doe reigne? Besides, abundance of vermin; doubtlesse these are procreated of putrifaction, and this of heat, except we will forfeit our senses and reason; of which he being afraid, confesseth at last, that such a heat tendeth to dissolution. He will not have liquifaction to proceed from any of the foure prime qualities, that he calls an inutile speculation, but from his own phantomes. For *bodies (saith he) that are more turgid of spirit, or that have their spirits more straitly imprisoned as metals, or that hold them better pleased and content as butter, are liquifiable.* How happy then are those spirits which dwell in butter, where they have pleasure and content, in comparison of those vvretched spirits vvhich are imprisoned in Irons and other metals, and yet how these spirits should make the metall turgid, I know not. Surely these are but crasie fanfies, vvhereas it is apparent to all intelligible men, that these things are most liquifiable, which aboundeth most with congealed moisture, whether it be aeriall



and oily, as in pitch, butter, wax, and grease; or watrish alone, as in Ice; or of a middle nature between both; or peculiar, as the moisture of metals. And to tell us, That wood, clay, free-stone, &c. are not liquifiable, because they are bodies jejune of spirits, is ridiculous; for there are more spirits in vegetables then in metals: and it is plain, that clay and stones melt not, because they want moisture, which is in metals. So it is not the dilatation of the spirits (as he saith) by heat, which causeth wax to melt at the fire; but the rarefaction of the moisture by heat, which was before contracted by the cold. For this cause dry wood is more fragile then green, stone then metall, and fictile earth then crude, because there is no moisture in the one comparable to the moisture of the other.

- 844 He tels us, that the hardnes of body is caused chiefly by the jejuneſs of the ſpirits. Indeed this Philoſophy is ſomewhat jejune; for I would fain know whether there be not more ſpirits and leſs jejune in the hard bodies of Cloves, Nutmegs, and Cinnamon, then in the ſoft bodies of Wooll, Silk, and Cotton? According to his Philoſophy there is a greater quantity of Spirits in a pellet of butter, becauſe ſofter, then in a Nutmeg which is harder; he that beleeves this, let him when he is troubled with flatulencies in his ſtomack, uſe butter, and not hard ſpices. He ſaith, That
- 851 *Moiture doth chiefly colour hair; but drineſs turneth them gray and white.* In his Philoſophy then gray and white are not colours,
- 873 nor indeed blacknes, which he ſaith afterwards, *is but a privative,* and conſequently hath no entity. *Ariſtotle* indeed ſometimes calls black a privation; but there he uſeth the words in a large ſenſe: for if it were properly privative, how could other colours be made of black and white, ſeeing of habits and privations nothing can be made. He ſaith, That *ſome fiſhes be greater then any beaſts, becauſe theſe have not their moiſture drawn by the air and ſun-beams. Alſo they reſt always in a manner, and are ſupported by the water.* If theſe be the reaſons of fiſhes greatneſs, then why are Smelts and other leſſer fiſhes, ſmaller then the beaſts? Or why are they not as big as Whales, ſeeing neither air nor ſun-beams draw away their moiſture, and are alſo ſupported by the water? The true cauſe then of the bigneſs of fiſhes above the beaſts, is the predominance of moiſture in them, which is eaſily extendible. And indeed it is a frivolous thing to give reaſons for the different magnitudes of the creatures, ſeeing Nature hath given to each creature a determinate magnitude and period of duration. And whereas he thinks, that fiſh doe reſt in a manner when they ſwim, becauſe they are ſupported by



by the water; he may as well say, That beasts and men rest when they walk and run, because supported by the earth: they that swim find there is no rest, but labour and motion.

Before my Lord told us, That by heat in putrifaction the spirits 836  
are emitted, suppressed, and suffocated: But now he saith, That the 856  
spirits in putrifaction gather heat. How the spirits at the same  
time should be destroyed by the heat, and yet gather heat, is so  
sublime a fanisie, that no fanisie but his own can reach it. Water 865  
(saith he) being contiguous with air cooleth it, but moystneth it not,  
except it vapour, because heat & cold have a virtuall transaction with-  
out communication of substance, but moysture not. He takes it for  
granted, which no Philosophy will grant him, to wit, that ac-  
cidents can passe from one subject to another without their  
substance, which is to make accidents subsist by themselves, and  
to be all one with the substance, which is repugnant to sense  
and reason: therefore without vapours neither can the water  
moysten nor cool the air. He saith, Air is not without some secret 866  
degree of heat. He needs make no secret of it, for it is manifest,  
that the air is hot and moist, as the fire is hot and dry; but  
for any secret degree of light in the air, I deny: For though  
(as he saith) Cats and Owles see in the night, this is not be-  
cause there is any degree of light in the air; for what light can  
there be in a dark dungeon where yet a Cat can see? The air  
is not a light body of it self, being diaphanous; for the cele-  
stially sphears are not light, neither is there any luminous body  
in the dark Dungeon, except the Cats eyes, which afford light  
enough to the Cat to see his object. He gives us a reason why  
the limbs on the right side are stronger, Because motion is holpen 876  
from the liver. How the liver should help motion, is not known  
in Anatomy, seeing motion and its Organs are from the brain,  
not from the liver: He had better have said, that motion is hol-  
pen from the heart, and so might have inferred, that the left  
side limbs are strongest. But indeed the true cause why the  
right side is stronger then the left, is, because the right limbs  
are bigger: but why Nature made them bigger or stronger, no  
other reason can be given, then that the right side is hotter, be-  
cause there is the fountain of blood. He saith, That all spongie 884  
bodies expell the air, and draw in liquor. This is not so; for why  
should such a body expell the air and draw in liquor; but  
when the liquor enters into a spongie body the air gives place  
as a void penetration: therefore Sugar expels not the air to  
suck up the Wine, but the wine enters into the Sugar, and ex-  
pels the air, so that the Sugar is a meer patient. He tells us,  
That



937 That stone walls are not so wholesome as wood, or bricks. This assertion stands neither with experience nor reason; for they who have lived with their predecessors within stone walls many hundredths of years, never found any unwholesomenesse by the stones, and it is against reason, that dry stones, who as he phraseth it, are jejune of spirits, should afford any vapours, or unwholesome dampes. It's true, that in moyst weather there be some Sea-stones, or such as are taken out of Rivers, will sweat; but I have seen such drops upon brick-walls. This proceeds neither from the stone nor brick, but from the air, which falling upon the hard stone, and being resisted for want of pores, from penetrating, stayeth there, and by the coldness of the stone turns to water-drops, even upon Marble. It is certain, saith he, that potions, incense, perfumes, and oynments, do naturally work upon the imaginations. The contrary rather is certain, to wit, that the imagination worketh upon these, not they upon it: for according to the strength of imagination the physick works, and not according to the strength of physick doth the imagination work. For sometimes the smell or sight of physick have wrought, not upon the imagination, but upon the body by the power of imagination, so that this is the prime cause why the physick worketh, which will not work at all in others whose imagination is weak and dull.

954 The cramp (saith he) cometh of contraction of sinews either by cold or driness. The cramp cometh by distention as well as by contraction, by heat and moistnesse as well as by cold and driness. A Lute string wil break as soon in moist weather when it swells, as in dry weather when it shrinks. And Hippocrates tells us, that the cramp proceeds as well from repletion as from inanition: for gluttony, drunkennesse, and suppressing of accustomed evacuations, procure the cramp as well as fasting, watching, bleeding, burning fevers, and vomiting, chiefly by Hellebor, which I can speak to my grief: for I never knew what the cramp was, till I was let blood and purged with Hellebor by an unskillfull Physician. And indeed the cramp is not so much the affection of the sinews, as of the muscles; for it is the involuntary contraction of the muscle to its originall or beginning, because not the nerve but the muscle, is the proper instrument of motion, which by the cramp is hurt; so that this infirmity hath different names from the different muscles in which it is. If it be in the muscles of the eye, it is called *Strabismus*; in the yard, *Satyriasis*; in the muscle of the jaw-bone, *Trismus*; in the muscles of the mouth, *Spasmus Cynicus*, or the Dog-cramp. In the Epileptic



leptic also, or falling sicknesse, there is a kind of cramp. And many times the cramp proceeds from flatulencies in the muscles, which though they be the proper organs of convulsions, or cramps, yet the cause is many times in the nerves, which being contracted by the sharpnesse or fulnesse of humors, or by malignant vapours, draw the muscles with them.

Because the Hedg-hog putteth forth many prickles, therefore he inferres, That *the juyce of a Hedg-hog must needs be harsh and dry.* There is no necessity for this, because the harsh & dry matter is expelled by nature into the prickles. The flesh of some fishes, whose shells or skins are full of prickles, is neither harsh nor dry. The Rose sends forth many prickles, and yet it is both pleasant, odoriferous, cooling and moist. So are the Raspberries. He tells us, That *Mummy hath a great force in stanching of blood.* But I wish he could tell us where we may find it: For the true *Mummy* which was found in the Tombes of the Egyptian Kings, which were embalmed vwith divers pretious liquors and spices, are spent long agoe, so that the *Mummy* now in use is only the substance of dried Karkasses digged out of the sands, being overwhelmed there, in which there is no more vertue to stanch blood, then in a stick. He saith, *All life hath a sympathy with salt.* In hogges I think its true; for as life is the salt of a living hogge, so salt is the life of a dead hogge: For both life and salt keep the body from putrifying: otherwise I know little or no sympathy that salt hath with life; for it destroyeth the life of many creatures. But he is mistaken vwhen he saith, *That salt draweth blood, because being laid to a cut finger, healeth it.* For salt is laid to a cut finger, not to draw the blood, vvhich cometh too fast of it selfe vwithout drawing; but to repell the blood, and to stop its running. It heals them, not by drawing the blood, but by absterfion, exsiccation, astringion and resisting putrifaction.

Thus I have cursorily run over my Lords new Philosophy, vvhich he calls a *Wood*, and so it is indeed; for here a young Scholar may quickly lose himselfe, and shal encounter with many bryers and brambles. I find that Philosophy is like Wine, the older the better to the taste; new Wine is pleasant, and so are new conscripts to the mind: but to the intelligent man oldest is wholesomest and lesse flatulent. And indeed that which they call new Philosophy, is nothing but the old in a new dressing, vvhich is neither so handsome nor so usefull as the other. They have found out new terms, which are neither so proper nor significant as the former. They have metamorphosed



phosed the elementary qualities both first and second, into spirits, so that now this word, like a nose of wax, serves them for all shapes. I find in my Lords book much dross mingled with his gold; he doth wrong both himself and his reader, in undertaking to give the causes or reasons of every thing: For Nature is pleased in thousands of things, to sport herself with variety. Who can give the cause of so many different forms in beasts, birds, and fishes; of so many different shapes and colours in herbs, trees, and plants; of so many different streaks and spots in shels, stones, and other things. He that takes upon him to give reasons of all these varieties, will take too much upon him. But as *Scaliger* saith, It is the part of true wisdom not to be too wise.

Wheras *Aristotle* had with infinite pains and industry, and not without singular dexterity, reduced all entities into certain heads, and placed them in ten Classes, or Predicaments to avoid confusion, and that we might with the more facility find out the true genus and difference of things, for our more easie defining, describing, dividing of things, and methodicall arguing upon any subject. Which *Aristotelian* way hath been received and approved by all Universities, and the wise men since his time in all ages, as being the best, easiest, most methodical, and most consonant to Reason, of all the wayes yet found out: These new Philosophers, as if they were wiser then all the world besides, have like fantastick travellers, left the old beaten and known path, to find out wayes unknown, crooked and unpassable, and have reduced his comely order into the old chaos, jumbling the Predicaments so together, that their Scholars can never find out the true genus of things. For example, they tell us, that the qualities, to wit, of heat, cold, &c. are spirits, consequently substances; so sometimes again they will have these to be qualities, and sometimetmes to be motions and actions. Thus *Proteus*-like they turn themselves into all shapes, so that we know not in what predicament to put their heat, or what Genus to give it. *Comenius* in his reformed Physicks, gives us some wise reasons to prove that heat is motion, because forsooth *There is not with us a body that is perpetually hot*. Besides that this is false, for our fire is perpetually hot, and never cold, water perpetually moist and never dry, the air perpetually light and never heavy, the earth perpetually heavy and never light; so it is ridiculous to think, that whatsoever is not either perpetually hot or cold, moist or dry, &c. must be motion: for by this reason all sublunary entities must be motions, because there



there is no other permanent quality except in a few. But let us examine the absurdities of this conceit. 1. If heat, cold, and other qualities be motions, then they are all imperfect entities, for motion is such, as being (*in fieri*, not *in facto*.) But this is untrue; for all qualities are perfect entities in their own kind. 2. Rest is the perfection and end of motion; but it is not the end and perfection of heat and cold: for the coldnesse of a standing Lake is not more perfect because it rests, then of a river because it moves. 3. Rest is opposite to motion, cold is opposite to heat, how then can heat and cold be motions? 4. Motion is (*commune sensibile*) an object of divers senses, for it is perceptible by the eye, by the ear in sounds, and by the tact also; but heat and cold are onely perceptible to the tact. 5. Motion addeth weight to a heavy body; it is the motion of the Cutter that makes the Ax cut down the tree, whereas neither the heat nor coldnesse of the Ax addeth any thing to the action of the Ax. 6. Motion begets heat, therefore they cannot be the same, except wee will make one and the same entity to work upon, and produce it selfe, to be both cause and effect, agent and patient to it selfe, which is an absurd contradiction. 7. It is not motion but heat that attenuateth, penetrateth, openeth, ripeneth, dissolveth, congregateth homogeneous things, & disgregateth heterogeneous. Again, they reason thus (*Comen. Phys. c. 4.*) that heat penetrates and distends, cold stoppeth & contracteth, therefore they are motions. They may as well infer, that light is a motion, because it penetrateth glasse, or that wine-vinegar, oyles, or any substance that penetrates, are motions, which are childish conceits. And no lesse feeble is their third Argument, whereby they prove heat to be a motion, *Because it wasteth and consumeth even the hardest metals.* Heat preserveth as well as wasteth. Is it a motion in both regards? Again, is there no difference between the agent and the action, the mover and the motion, the waster and the wasting of a thing?

As in many other vain conceits they shew their weaknesse, so likewise in this, when they call colours light, and say, (*Comen. c. 4.*) That colours of themselves have no entity, but from the light, because they are not seen without the light. Thus they confound (after their maner) the object (which) & the mean (by which) we see. We see colours, we see not the light, but we see by the light. This doctrine, if there bee no entity in colours, but what is given by the light, then in darknesse there must be non-entities; and so a Crow is not black, nor a Swan white, but when the Sun shines on them: blood then is not red within  
the



the veins, nor milk white within the breasts, till they be let out into the light. What can be more ridiculous then to think, that because the light gives visibility, therefore it gives entity to things. To a blind man all colours are non-entities, which to him that seeth them are entities at the same time; so at the same time colours are something and nothing. My Lord Bacon saith, That the colours of Gems are fine spirits, how then can they be non-entities? And surely, if whatsoever we see not be non-entities, we may conclude that substances are non-entities, for they are not visible: and if it be the light that giveth being to colours, it must needs follow, that black hairs turn gray in us, not from the constitution of our temperaments, but from the light: and so it is onely the light that makes some black, some red, some flaxen, and some gray haired. Again, they say, (c. 4.) *Colour diffuseth it selfe through the air, as light doth, therefore it is light.* This is untrue; for colour doth not diffuse it self through the air as light doth: for the colour of a Rose is onely in the Rose, and not diffused in the air; they should rather say, That the smell of the Rose is diffused through the air, and that therefore the smell is light, or that heat and cold are lights, because they are diffused. Again, they say, (c. 4.) *That the light produceth in the Rain-bow different colours.* What then? Will it follow that therefore the light produceth all colours? Will they make no difference between reall and apparent or intentionall colours? The colour which is in a green glasse, is reall; but that which from the glasse is cast on the paper, is onely apparent. The colour of my face is reall, but not in the looking-glasse, there it is onely apparent. If light makes colours, why makes it not snow black, and coals white. Lastly, they tell us, (c. 4.) *That specificall forms are made up of qualities.* If this be so, then things cannot differ specifically one from another: for what differs in qualities, differs onely accidentally; and so must a man differ from a horse: one man differs from another onely in qualities; but if he differ onely in qualities, then *Alexander* and his horse *Bucephalus* are specifically the same. But whence proceed these qualities which make the difference? not from the matter, for in this they differ not; not from themselves, for nothing can produce it self. It remains then, that they result from the substantiall form, from which all proper and specificall accidents have their dependence, both in entity and operation. And indeed to deny the substantiall form, is to deny the composition and generation of things; for in all compounded bodies there must be two parts at least to make up the composition, and these



these can be none else but matter and form. For qualities are no parts, nor can they make a composition with the substance. And whereas the end of generation is the production of the form, there would be no generation at all, if qualities only were produced; alteration there may be, generation there can be none.

Thus I have (good Reader) given thee a tast of our new Philosophy, or rather old pseudosophy: for indeed these new opinions are but old obsolete and rejected errors, raked out again from under their ashes, where they have lain buried many years. Here we see how queasie stomacks are weary to eat continually of one dish, though never so wholesome. I would not have any man so silly, as to think that I wrong those whose opinions here I ventilate. I honour their persons, memories and worths, though I oppose their dictates. The Traveller is not wronged, if when he goeth astray, he is told so, & the right way is shewed him. What hurt is it to tell our friend when he eateth too much raw fruit, that his health will be thereby indangered. If any man say, that I who point the way to others, am out of it my selfe; I will thankfully submit my self to him, that will set me right. I know we are all pretenders to truth, but few can find her out, she lieth so deep in the well: she is indeed the daughter of *Jupiter*, as the Poet calls her, and *θεῶν ὁμόπολις*, a fellow-citizen with the Gods, and *συνδιατρίβειν* one which hath the honor to be their guest, & sit at table with them, so that access to her is very full of difficulty; but this is my comfort, that in seeking her I follow the conduct of the most & wisest Philosophers, so that if I am out of the way, I am not alone; and better it is to go astray with the best then with the worst, with company then alone. And if I cannot in this life find out that beautifull Lady, I will comfort my self in the enjoyment of her picture, or of that which most resembleth her; as that amorous Queen, who missing of the Father, was content to solace herself with the embracements of his young Son.

*Hæc gremio Ascanium genitores imagine capta,  
Detinet.*

*F I N I S.*









Good Reader, I met yesternight with this learned Letter, which I have briefly answer'd, and have annexed to this Apendix, that thou mayst know how offensive Dr. Harvey's opinion is to others as well as to my self.

Doctissime vir,

**N**ISI summa tua eruditio aditum mihi patefacere videretur, non auderem te, cum quo nec familiaritas nec consuetudo mihi unquam fuit compellari: sed quod persuasum habeam doctissimos quosq; maxime obvios plenosq; humanitatis esse, hoc mihi hærenti animos dedit. Hæc igitur veniam à viro erudito (uti spero) impetratâ, par est ut pauca, quid ad hoc consilium me compulit, exponam. Anno proximè elapso, Exercitationes viri celeberrimi Dom. *Harvey*, De Generatione *Animalium*, in publicæ famæ comitium prodierunt. In quibus argutissimus Author, relictis medicorum placitis, qui ex maris & feminae seminibus conceptû fieri statuunt; atq; etiam *Aristoteli* dissidens, qui maris semen formam, ut agens conferre foeminam materiam asserit: novam generationis Sciographiam depingit. In qua nec maris semen, ut quod uterum nequaquam ingreditur, nec foeminæ, quippe quæ semine caret; locû ullum habere contendit: sed foeminam

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foecun-



fœcundam fieri, post tactum in coitu spermaticum, simili virtute, quâ fercum à magnete tactum : hoc notat contagium prolificum. Nec hîc subtilis vir requiescit, verum postea in altiore gradu pedem figere videtur. Et fœminam ex conceptu Idææ generalis sine materia impregnata esse, & à similitudine constitutionis cerebri & uteri, utriusq; functionem similem esse vult. Ut quemadmodum cerebro artificis inest ratio sui operis & speciei immaterialis, ita utero inest species sive forma filius immaterialis, quæ sit causa impregnationis. Hæc summa atq; ultima meta est, quam exercitationum suarum cursu contendere nititur, plura tamen sunt, per totam operis seriem disseminata, quæ summus ille Philosophiæ augur, rationibus, ex ipsius naturæ penetralibus petitis, quasi quirinali lituo designat. Dum hæc perlegi veterum doctrinæ ita contraria, luctabantur tonsæ lento & difficili illo marmore : substiti paulisper sollicitus, donec statui viri alicujus docti opem rogare. Cum protinus occurrebas tu, ut qui contra Philosophia novatores strenuum te exhibuisti athletam. Rogatum igitur te venit hæc mea chartula, ut adjutes dubitantem, tuamq; de his, quæ apud me plurimum valebit, sententiam aperias : Hæc si concesseris in omnes abstringes gratias,

*Verum eruditionis tuæ cultorem.*

I. P.





Doctissimo Viro. J. P.



Esterna nocte (vir eruditissime, sed solo  
literarum & candoris nomine mihi co-  
gnita) Epistolam tuam latiomelle con-  
ditam accepi; in qua sententiam meam  
requiris, quodnam judicium habendum  
sit de clarissimi Doctoris Harvæi opinione in Generati-  
one Animalium. Ego sane non sum nescius meæ imbe-  
cilitatis quamq; impar sit congressus; Achilli nihilomi-  
nus veritatis præsideo fretus, animam assumpsi ut cum  
Homero loquar ἑταίροισιν, & conatus sum hesitantes  
per flumen traducere; nam suasu amicorum aggressus  
sum Doctoris literatissimi opinionem eamq; ni fallor  
conferti pro meis viribus in tractatu illo Anglico quem  
nuperrime typis commisi: scio plurimos esse me longe  
in doctrinæ laude præstantiores (inter quos tu mihi vi-  
deris non minimus) qui debebant hanc provinciam sus-  
cepere; sed cum adverterem omnes monomacheam hanc  
detracentes volebam potius me periculo exponere,  
quam alto silentio permittere, ut opinio talis apud no-  
strates (qui quicquid novum est avide & sine mastica-  
tione deglutiant) hospitium haberet fortasse stomacha-  
bitur Doctor quod ego micantibus eruditionis sue ra-  
diis, nebulam hac mea scriptione objicerem; & famæ  
sue splendorem mea refutatione obfuscarem; sed pro  
ingemita viris doctis humanitate non ignorat in civi-  
tate libera debere linguas & pennas esse liberas, & op-  
pugnandos errores a quocumq; Authore processerint:  
amicitia enim veritatis Platonice & Socraticæ præ-  
ferenda est. Ego me intra modestiæ limites continui,



neque quidquam à mea penna lapsum est, quod posset  
illius fame officere; neque ab omni errore liber esse  
potest, quamdiu homo est; si autem pergat hanc suam  
Helenam ulterius propugnare: Ibo animis contra vel  
magnum præstet Achillem. Interea autem vir doctis-  
sime quisquis es haud equidem invitis cœlestibus au-  
ras vitales carpis, tibi meam sententiam breviter ape-  
riam, quum me tam humaniter compellas, Hæc opinio  
videtur & à religione & à recta ratione prorsus alie-  
na, nam si maris semen uterum non ingrediatur, sed  
fœmina tactu virtuali solum concipiat, Isaac, & pro-  
inde Christus non magis dicendi sunt semen Abrahæ;  
quam solis, nam sol contactu virtuali generat homi-  
nem, neq; potest ullus filius dici aut esse os de ossibus,  
aut caro de carne parentū, quando mater semine careat  
patris autem semen uterum non ingrediatur. Hæc opinio  
tollit omnem amorem paternum: erga liberos omnemq;  
providentiam, quis enim pater sollicitus erit heredita-  
tem illi relinquere quem scit non esse filium, quomodo  
autem filius dicendus est, qui ex substantia patris non  
est, (loquor hic de filio naturali, non adoptivo) quor-  
sum creavit Deus marem & fœminam, quorsum u-  
trumq; in arca conservavit, si absque maris semine  
concupere valet fœmina: vir non potest vocari adulter,  
nec ulli possunt generari in adulterio quum semen viri  
in uterum non recipiatur, cumq; quotidianum sit ut  
fœmina absque corporali tactu virilis seminis concipi-  
at, quid miraculi fuit Christum sic concipi, quorsum  
honorandus est pater ex quinto præcepto si pater non sit,  
quomodo autem pater est, qui non generat, & quo-  
modo generat si semen in uterum non emittat? Simi-  
le autem quo utitur Doctor sumptum à Magnete im-  
pertinens est: Nam dicit tactum spermaticum in coitu  
esse



esse virtualem, at cum ferrum tangitur à Magnete, ibi tactus est corporalis. Magnes etiam trahit corpus ferri, sic debet uterus semen si similitudo valet. Deinde Scire cupio utrum semen masculineum recipiatur intra matricem; an non si non? quo abit? cur etiam, aperitur matrix? ad recipiendam virtutem solum seminis sine corpore? nugæ. Virtus non est corpus, non ergo opus est apertione, nulla namq; penetratio dimensionum erit, si ostium occludatur; si autem recipiatur semen ab utero, & tangat sanguinem menstruum; Tactus ille corporalis erit, non virtualis. Præterea in tactu virtuali, tangens, aut est spiritus, sic anima virtualiter tangit corpus, intelligentia cælum; aut toto genere differt à re tacta; tale est cælum quod tangit inferiora corpora virtualiter: At semen, nec est spiritus, sed corpus, nec genere differt à sanguine, quia ex sanguine fit, ergo non tangit virtualiter. Dices: Magnes tangit ferrum virtualiter; sed hoc nego, nullus enim est tactus illic nisi corporalis; fertur quidem acus ad magnetem, ingenita quadam vi, sicut lapis ad centrum; an ideo concludemus centrum tangere virtualiter lapidem? nihil minus. Sed si concederem esse virtualem contactum in Magnete, rogo, cui fini data est illa virtus, nonne ut fiat contactus corporalis videmus enim hac corporaliter, se tangere nec contenta esse virtuali tactu; eodem modo semini data est virtus tangendi sanguinem in utero, ut realiter & corporaliter se tangant cum datur opportunitas. Debit etiam, Dr. nobis ostendere, quanta mora requiratur, & quanta distantia, ad virtualem hanc actionem. Videmus enim ferrum & magnetem non se tangere nisi in debita distantia, idque absq; ulla mora, quomodo etiam fit, ut filius referat patrem vultu & moribus, si paternum semen



semen, agat solum virtualiter. Si etiam seminis actio sit solus virtualis, quid opus erat calore, humore aliisque qualitatibus elementaribus? Virtualis quippe contactus fit ab occulta, non ab elementari & manifesta qualitate. Deinde nulla fit conceptio nisi semen detineatur in utero, at illa detentio est presentia corporalis non virtualis; nec ulla generatio dicenda est univoca si semen agat solum virtualiter; eodem enim modo generabitur homo, quo mus virtute solis ex putrefactione. Sed inepte vocat spermaticum tactum contagium, est enim contagium morbus contractus ex contactu; At coitus non est morbus, quum nihil magis sit secundum naturam. Cum autem dicit, Doctor feminam ex conceptu *Idea*, generalis sine materia impregnata esse: videtur nescire naturam *Idea* quae nil aliud est quam exemplar futuri opificii in mente opificis: exemplar autem nec est efficiens, nec materialis causa rerum, nam statua efficiens est statuarius materia lapidis aut lignum aut metallum: forma est representatio illius *Idea* quam artifex in mente habuit, secundum ergo exemplar illud artifex introducit formam statuæ in materiam ope variorum, instrumentorum, non ergo fit filius materialis ex immateriali, sed ex parentum semine & sanguine, ad exemplar illud seu filium immaterialem non in utero sed in cerebro, quod est propria sedes phantasmatum & Idearum ob organa apta & spiritus animales; neque enim ulla est similitudo (ut putat Doctor) inter cerebrum & uterum sive substantiam, sive qualitates, sive constitutionem, sive operationes consideremus; nam in cerebro producuntur *Idea* & phantasmata, in utero corporales substantie, in hoc est filius materialis in illo immaterialis; sed hec satis refutavimus in tractatu nostro Anglico, quare



*quar hic nolo tecum pluribus agere: Hac sufficiant  
ut scias me nec vetis tuis deesse, nec humanitati leges  
silentio meo violare voluisse; quare confestim vale, Vir  
literatissime & amicis sine furo tui, omniumque qui  
veritatem amant antiquam, conatus boni consule;*

April 24. 1652,

A. R.

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FINIS.

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... Jacobus ...  
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1622

A. R.

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