

# BROWNE THOMAS

THE WORKS OF SIR  
THOMAS BROWNE,  
VOLUME 2

Thomas Browne

**The Works of Sir Thomas  
Browne, Volume 2**

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# The Works of Sir Thomas Browne, Volume 2

## PREFATORY NOTE

The frontispiece to this volume is reproduced from a photograph kindly lent to me for the purpose by Mr. Charles Williams, F.R.C.S.E., of Norwich, whose note upon the measurements of Sir Thomas Browne's skull appeared as Appendix ii. in the edition of Browne's *Hydriotaphia* and *Garden of Cyrus*, published in the 'Golden Treasury Series,' by Messrs. Macmillan and Co., in 1896.

The identification of the author quoted in the margin of page 233 (Book v. Chapter x.). I owe to Mr. W. Aldis Wright.

C.S.

*May 1, 1904.*

# **PSEUDODOXIA EPIDEMICA**

## THE THIRD BOOK —*continued*

### CHAPTER XI Of Griffins

That there are Griffins in Nature, that is a mixt and dubious Animal, in the fore-part resembling an Eagle, and behind, the shape of a Lion, with erected ears, four feet and a long tail, many affirm, and most, I perceive, deny not. The same is averred by *Ælian*, *Solinus*, *Mela*, and *Herodotus*, countenanced by the Name sometimes found in Scripture, and was an Hieroglyphick of the Egyptians.

Notwithstanding we find most diligent enquirers to be of a contrary assertion. For beside that *Albertus* and *Pliny* have disallowed it, the learned *Aldrovandus* hath in a large discourse rejected it; *Mathias Michovius* who writ of those Northern parts wherein men place these Griffins, hath positively concluded against it; and if examined by the Doctrine of Animals, the invention is monstrous, nor much inferiour unto the figment of Sphynx, Chimæra, and Harpies, for though there be some flying Animals of mixed and participating Natures, that is, between Bird and quadruped, yet are their wings and legs so set together, that they seem to make each other; there being a commixtion of both, rather than an adaptation or cement of prominent parts unto each other, as is observable in the Bat, whose wings and fore-legs are contrived in each other. For though some species there be of middle and participating Natures, that is, of Bird and Beast, as Bats and some few others, yet are their parts so conformed and set together, that we cannot define the beginning or end of either; there being a commixtion of both in the whole, rather than an adaptation or cement of the one unto the other.

Now for the word γρύψ or *Gryps*, sometimes mentioned in Scripture *Levit. 11.*, and frequently in humane Authors, properly understood, it signifies some kind of Eagle or Vulture, from whence the Epithete *Grypus* for an hooked or Aquiline Nose. Thus when the Septuagint makes use of this word, *Tremellius* and our Translation hath rendred it the Ossifrage, which is one kind of Eagle. And although the Vulgar Translation, and that annexed unto the Septuagint, retain the word *Gryps*, which in ordinary and school construction is commonly rendred a Griffin, yet cannot the Latine assume any other sense then the Greek, from whence it is borrowed. And though the Latine *Gryphes* be altered somewhat by the addition of an *h*, or aspiration of the letter π, yet is not this unusual; so what the Greeks call τρόπαιον, the Latine will call *Trophæum*; and that person which in the Gospel is named Κλέοπας, the Latines will render *Cleophas*. And therefore the quarrel of *Origen* was unjust, and his conception erroneous, when he conceived the food of Griffins forbidden by the law of *Moses*: that is, Poetical Animals, and things of no existence. And therefore when in the Hecatombs and mighty Oblations of the Gentiles, it is delivered they sacrificed Gryphes or Griffins; hereby we may understand some stronger sort of Eagles. And therefore also when its said in *Virgil* of an improper Match, or *Mopsus* marrying *Nysa*, *Jungentur jam gryphes equis*; we need not hunt after other sense, then that strange unions shall be made, and different Natures be conjoined together.

As for the testimonies of ancient Writers, they are but derivative, and terminate all in one *Aristeus* a Poet of *Proconesus*; who affirmed that near the *Arimaspi*, or one-eyed Nation, Griffins defended the Mines of Gold. But this, as *Herodotus* delivereth, he wrote by hear-say; and *Michovius* who hath expresly written of those parts, plainly affirmeth, there is neither Gold nor Griffins in that Country, nor any such Animal extant; for so doth he conclude, *Ego vero contra veteres authores, Gryphes nec in illa septentrionis, nec in aliis orbis partibus inveniri affirmarim*.

Lastly, Concerning the Hieroglyphical authority, although it nearest approach the truth, it doth not infer its existency. The conceit of the *Griffin* properly taken being but a symbolical phansie, in so intollerable a shape including allowable morality. So doth it well make out the properties of a

*Guardian*, or any person entrusted; the ears implying attention, the wings celerity of execution, the Lion-like shape, courage and audacity, the hooked bill, reservance and tenacity. It is also an Emblem of valour and magnanimity, as being compounded of the Eagle and Lion, the noblest Animals in their kinds; and so is it appliable unto Princes, Presidents, Generals, and all heroick Commanders; and so is it also born in the Coat-arms of many noble Families of *Europe*.

But the original invention seems to be Hieroglyphical, derived from the Egyptians, and of an higher signification. By the mystical conjunction of Hawk and Lion, implying either the Genial or the sydereous Sun, the great celerity thereof, and the strength and vigour in its operations. And therefore under such Hieroglyphicks *Osyris* was described; and in ancient Coins we meet with Gryphins conjointly with *Apollo's*, *Tripodes* and Chariot wheels; and the marble Gryphins at Saint *Peters* in *Rome*, as learned men conjecture, were first translated from the Temple of *Apollo*. Whether hereby were not also mystically implied the activity of the Sun in Leo, the power of God in the Sun, or the influence of the Cœlestial *Osyris*, by *Moptha* the Genius of Nilus, might also be considered. And then the learned *Kircherus*, no man were likely to be a better *Oedipus*.

## CHAPTER XII Of the Phœnix

That there is but one Phœnix in the World, which after many hundred years burneth it self, and from the ashes thereof ariseth up another, is a conceit not new or altogether popular, but of great Antiquity; not only delivered by humane Authors, but frequently expressed also by holy Writers; by *Cyril*, *Epiphanius*, and others, by *Ambrose* in his *Hexameron*, and *Tertullian* in his Poem *De Judicio Domini*; but more agreeably unto the present sense, in his excellent Tract, *De Resurrectione carnis. Illum dico alitem orientis peculiarem, de singularitate famosum, de posteritate monstruosum; qui semetipsum libenter funerans renovat, natali fine decedens, atque succedens iterum Phœnix. Ubi jam nemo, iterum ipse; quia non jam, alius idem.* The Scripture also seems to favour it, particularly that of *Job* 21. In the interpretation of *Beda*, *Dicebam in nidulo meo moriar, et sicut Phœnix multiplicabo dies*: and *Psal.* 31. δίκαιος ὡσπερ φοῦνιξ ἀνθήσει, *vir justus ut Phœnix florebit*, as *Tertullian* renders it, and so also expounds it in his Book before alledged.

Against the story of the Phœnix.

All which notwithstanding, we cannot presume the existence of this Animal; nor dare we affirm there is any Phœnix in Nature. For, first there wants herein the definitive confirmator and test of things uncertain, that is, the sense of man. For though many Writers have much enlarged hereon, yet is there not any ocular describer, or such as presumeth to confirm it upon aspection. And therefore *Herodotus* that led the story unto the *Greeks*, plainly saith, he never attained the sight of any, but only in the picture.

Again, Primitive Authors, and from whom the stream of relations is derivative, deliver themselves very dubiously; and either by a doubtful parenthesis, or a timorous conclusion overthrow the whole relation. Thus *Herodotus* in his *Euterpe*, delivering the story hereof, presently interposeth, ἐμοὶ μὲν οὐ πίστα λέγοντες; that is, which account seems to me improbable. *Tacitus* in his annals affordeth a larger story, how the Phœnix was first seen at *Heliopolis* in the reign of *Sesostris*, then in the reign of *Amasis*, after in the days of *Ptolomy*, the third of the *Macedonian* race; but at last thus determineth, *Sed Antiquitas obscura, et nonnulli falsum esse hunc Phœnicem neque Arabum è terris credidere.* *Pliny* makes yet a fairer story, that the Phœnix flew into *Egypt* in the Consulship of *Quintus Plancius*, that it was brought to Rome in the Censorship of *Claudius*, in the eight hundred year of the City, and testified also in their records; but after all concludeth, *Sed quæ falsa nemo dubitabit*, As we read it in the fair and ancient impression of *Brixia*; as *Aldrovandus* hath quoted it, and as it is found in the manuscript Copy, as *Dalechampius* hath also noted.

Moreover, Such as have naturally discoursed hereon, have so diversly, contrarily, or contradictorily delivered themselves, that no affirmative from thence can reasonably be deduced. For most have positively denied it, and they which affirm and believe it, assign this name unto many, and mistake two or three in one. So hath that bird been taken for the Phœnix which liveth in *Arabia*, and buildeth its nest with Cinnamon; by *Herodotus* called *Cinnamulgus*, and by *Aristotle*, *Cinnamomus*; and as a fabulous conceit is censured by *Scaliger*. Some have conceived that bird to be the Phœnix, which by a *Persian* name with the *Greeks* is called *Rhyntace*; but how they made this good we find occasion of doubt; whilst we read in the life of *Artaxerxes*, that this is a little bird brought often to their Tables, and wherewith *Parysatis* cunningly poisoned the Queen. The *Manucodiata* or Bird of Paradise, hath had the honour of this name, and their feathers brought from the *Molucca's* do pass for those of the Phœnix. Which though promoted by rarity with us, the *Eastern Travellers* will hardly admit; who know they are common in those parts, and the ordinary plume of *Janizaries* among the *Turks*. And lastly, the Bird *Semenda* hath found the same appellation, for so hath *Scaliger* observed and refuted; nor will the solitude of the Phœnix allow this denomination; for many there are of that

species, and whose trifistulary bill and crany we have beheld our selves. Nor are men only at variance in regard of the Phœnix it self, but very disagreeing in the accidents ascribed thereto: for some affirm it liveth three hundred, some five, others six, some a thousand, others no less then fifteen hundred years; some say it liveth in *Æthiopia*, others in *Arabia*, some in *Egypt*, others in *India*, and some in *Utopia*; for such a one must that be which is described by *Lactantius*; that is, which neither was singed in the combustion of *Phaeton*, or overwhelmed by the inundation of *Deucalion*.

Lastly, Many Authors who have discoursed hereof, have so delivered themselves, and with such intentions, that we cannot from thence deduce a confirmation. For some have written Poetically, as *Ovid*, *Mantuan*, *Lactantius*, *Claudian*, and others: Some have written mystically, as *Paracelsus* in his Book *De Azoth*, or *De ligno et linea vitæ*; and as several Hermetical Philosophers, involving therein the secret of their Elixir, and enigmatically expressing the nature of their great work. Some have written Rhetorically, and concessively, not controverting, but assuming the question, which taken as granted, advantaged the illation. So have holy men made use hereof as far as thereby to confirm the Resurrection; for discoursing with Heathens who granted the story of the Phœnix, they induced the Resurrection from principles of their own, and positions received among themselves. Others have spoken Emblematically and Hieroglyphically; and so did the *Egyptians*, unto whom the Phœnix was the Hieroglyphick of the Sun. And this was probably the ground of the whole relation; succeeding Ages adding fabulous accounts, which laid together built up this singularity, which every Pen proclaimeth.

As for the Texts of Scripture, which seem to confirm the conceit, duly perpended, they add not thereunto. For whereas in that of *Job*, according to the Septuagint or Greek Translation we find the word Phœnix, yet can it have no animal signification; for therein it is not expressed φοῖνῖξ, but στέλεχος φοίνικος, the trunk of the Palm-tree, which is also called Phœnix; and therefore the construction will be very hard, if not applied unto some vegetable nature. Nor can we safely insist upon the Greek expression at all; for though the Vulgar translates it *Palma*, and some retain the word Phœnix, others do render it by a word of a different sense; for so hath *Tremellius* delivered it: *Dicebam quod apud nidum meum expirabo, et sicut arena multiplicabo dies*; so hath the *Geneva* and ours translated it, *I said I shall die in my Nest, and shall multiply my days as the sand*. As for that in the Book of Psalms, *Vir justus ut Phœnix florebit*, as *Epiphanius* and *Tertullian* render it, it was only a mistake upon the Homonymy of the Greek word Pœnix, which signifies also a Palm-tree. Consent of names. Which is a fallacy of equivocation, from a community in name inferring a common nature; and whereby we may as firmly conclude, that *Diaphœnicon* a purging Electuary hath some part of the Phœnix for its ingredient; which receiveth that name from Dates, or the fruit of the Palm-tree, from whence, as *Pliny* delivers, the Phœnix had its name.

Nor do we only arraign the existence of this Animal, but many things are questionable which are ascribed thereto, especially its unity, long life, and generation. As for its unity or conceit there should be but one in nature, it seemeth not only repugnant unto Philosophy, but also holy Scripture; which plainly affirms, there went of every sort two at least into the Ark of *Noah*, according to the Text, *Gen. 7. Every Fowl after his kind, every bird of every sort, they went into the Ark, two and two of all flesh, wherein there is the breath of life, and they that went in, went in both male and female of all flesh*. It infringeth the benediction of God concerning multiplication. God blessed them, saying, *Gen. 1. Be fruitful and multiply, and fill the waters in the seas, and let fowl multiply in the earth*: And again *Chap. 8., Bring forth with thee every living thing, that they may breed abundantly in the earth, and be fruitful and multiply upon the earth*: which terms are not applicable unto the Phœnix, whereof there is but one in the world, and no more now living then at the first benediction. For the production of one, being the destruction of another, although they produce and generate, they encrease not; and must not be said to multiply, who do not transcend an unity.

As for longævity, that it liveth a thousand years or more; beside that from imperfect observations and rarity of appearance, no confirmation can be made; there may be probable a mistake in the

compute. For the tradition being very ancient and probably Egyptian, the *Greeks* who dispersed the Fable, might sum up the account by their own numeration of years; whereas the conceit might have its original in times of shorter compute. For if we suppose our present calculation, the Phœnix now in nature will be the sixth from the Creation, but in the middle of its years; and if the *Rabbins* Prophecie *That the World should last but six thousand years.* succeed, shall conclude its days not in his own but the last and general flames, without all hope of Reviviction.

Concerning its generation, that without all conjunction it begets and reseminates it self, hereby we introduce a vegetable production in Animals, and unto sensible natures, transfer the propriety of Plants; that is, to multiply within themselves, according to the Law of the Creation *Gen. 1., Let the earth bring forth grass, the herb yielding seed, and the tree yielding fruit, whose seed is in it self.* Which is indeed the natural way of Plants, who having no distinction of sex, and the power of the species contained in every *individuum*, beget and propagate themselves without commixtion; and therefore their fruits proceeding from simpler roots, are not so unlike, or distinguishable from each other, as are the off-springs of sensible creatures and proliferations descending from double originals. But Animal generation is accomplished by more, and the concurrence of two sexes is required to the constitution of one. And therefore such as have no distinction of sex, engender not at all, as *Aristotle* conceives of Eels, and testaceous animals. And though Plant-animals do multiply, they do it not by copulation, but in a way analogous unto Plants. So *Hermaphrodites* although they include the parts of both sexes, and may be sufficiently potent in either; yet unto a conception require a separated sex, and cannot impregnate themselves. And so also though *Adam* included all humane nature, or was (as some opinion) an *Hermaphrodite*, yet had he no power to propagate himself; and therefore God said, *It is not good that man should be alone, let us make him an help meet for him;* that is, an help unto generation; for as for any other help, it had been fitter to have made another man.

Now whereas some affirm that from one Phœnix there doth not immediately proceed another, but the first corrupteth into a worm, which after becometh a Phœnix, it will not make probable this production. *Irregularities.* For hereby they confound the generation of perfect animals with imperfect, sanguineous with exanguious, vermiparous with oviparous, and erect Anomalies, disturbing the laws of Nature. Nor will this corruptive production be easily made out in most imperfect generations; for although we deny not that many animals are vermiparous, begetting themselves at a distance, and as it were at the second hand (as generally Insects, and more remarkably Butter-flies and Silkworms) yet proceeds not this generation from a corruption of themselves, but rather a specifical and seminal diffusion, retaining still the Idea of themselves, though it act that part a while in other shapes. And this will also hold in generations equivocal, and such as are not begotten from Parents like themselves; so from Frogs corrupting, proceed not Frogs again; so if there be anatiforous Trees, whose corruption breaks forth into Bernacles, yet if they corrupt, they degenerate into Maggots, which produce not them again. For this were a confusion of corruptive and seminal production, and a frustration of that seminal power committed to animals at the Creation. The problem might have been spared, *Why we love not our lice as well as our children?* *Noah's* Ark had been needless, the graves of Animals would be the fruitful'st wombs; for death would not destroy, but empeople the world again.

Since therefore we have so slender grounds to confirm the existence of the Phœnix, since there is no ocular witness of it, since as we have declared, by Authors from whom the story is derived, it rather stands rejected; since they who have seriously discoursed hereof, have delivered themselves negatively, diversly, or contrarily; since many others cannot be drawn into Argument, as writing Poetically, Rhetorically, Enigmatically, Hieroglyphically; since holy Scripture alledged for it duly perpended, doth not advantage it; and lastly, since so strange a generation, unity and long life, hath neither experience nor reason to confirm it, how far to rely on this tradition, we refer unto consideration.

But surely they were not well-wishers unto parable *Physickeὑπόρριστα.*, or remedies easily acquired, who derived medicines from the Phœnix; as some have done, and are justly condemned

by *Pliny*; *Irridere est vitæ remedia post millesimum annum reditura monstrare*; It is a folly to find out remedies that are not recoverable under a thousand years; or propose the prolonging of life by that which the twentieth generation may never behold. More veniable is a dependance upon the Philosophers stone, potable gold, or any of those Arcana's whereby *Paracelsus* that died himself at forty-seven, gloried that he could make other men immortal. Which, although extreamly difficult, and *tantum non* infesible, yet are they not impossible, nor do they (rightly understood) impose any violence on Nature. And therefore if strictly taken for the Phœnix, very strange is that which is delivered by *Plutarch* *De sanitate tuenda.*, That the brain thereof is a pleasant bit, but that it causeth the head-ach. Which notwithstanding the luxurious Emperour *Heliogabalus*. could never taste, though he had at his Table many a Phœnicopterus, yet had he not one Phœnix; for though he expected and attempted it, we read not in *Lampridius* that he performed it; and considering the unity thereof, it was a vain design, that is, to destroy any species, or mutilate the great accomplishment of six days. And although some conceive, and it may seem true, that there is in man a natural possibility to destroy the world in one generation, that is, by a general conspire to know no woman themselves, and disable all others also: yet will this never be effected. And therefore *Cain* after he had killed *Abel*, were there no other woman living, could not have also destroyed *Eve*: which although he had a natural power to effect, yet the execution thereof, the providence of God would have resisted: for that would have imposed another creation upon him, and to have animated a second Rib of *Adam*.

## CHAPTER XIII

### Of Frogs, Toads, and Toad-stone

Concerning the venomous Urine of Toads, of the stone in the Toads head, and of the generation of Frogs, conceptions are entertained which require consideration. And first, that a Toad pisseth, and this way diffuseth its venome, is generally received, not only with us, but also in other parts; for so hath *Scaliger* observed in his Comment, *Aversum urinam reddere ob oculos persecutoris perniciosam ruricolis persuasum est*; and *Mathiolus* hath also a passage, that a Toad communicates its venome, not only by Urine, but by the humidity and slaver of its mouth; which notwithstanding strictly understood, may admit of examination: for some doubt may be made whether a Toad properly pisseth, that is distinctly and separately voideth the serous excretion: for though not only birds, but oviparous quadrupeds and Serpents have kidneys and ureters, and some Fishes also bladders: yet for the moist and dry excretion they seem at last to have but one vent and common place of exclusion: and with the same propriety of language, we may ascribe that action unto Crows and Kites. And this not onely in Frogs and Toads, but may be enquired in Tortoyses: that is, whether that be strictly true, or to be taken for a distinct and separate miction, when *Aristotle* affirmeth, that no oviparous animal, that is, which either spawneth or layeth Eggs, doth Urine except the Tortois.

The ground or occasion of this expression might from hence arise, that Toads are sometimes observed to exclude or spit out a dark and liquid matter behind: which we have observed to be true, and a venomous condition there may be perhaps therein, but some doubt there may be, whether this is to be called their urine: not because it is emitted aversly or backward, by both sexes, but because it is confounded with the intestinal excretions and egestions of the belly: and this way is ordinarily observed, although possible it is that the liquid excretion may sometimes be excluded without the other.

As for the stone commonly called a Toad-stone, which is presumed to be found in the head of that animal, we first conceive it not a thing impossible: nor is there any substantial reason why in a Toad there may not be found such hard and lapideous concretions. For the like we daily observe in the heads of Fishes, as Cods, Carps, and Pearches: the like also in Snails, a soft and exosseous animal, whereof in the naked and greater sort, as though she would requite the defect of a shell on their back, Nature near the head hath placed a flat white stone, or rather testaceous concretion. Which though *Aldrovandus* affirms, that after dissection of many, he found but in some few: yet of the great gray Snails, I have not met with any that wanted it: and the same indeed so palpable, that without dissection it is discoverable by the hand.

Again, though it be not impossible, yet it is surely very rare: as we are induced to believe from some enquiry of our own, from the trial of many who have been deceived, and the frustrated search of *Porta*, who upon the exploremet of many, could scarce find one. Nor is it only of rarity, but may be doubted whether it be of existencie, or really any such stone in the head of a Toad at all. For although *Lapidaries* and questuary enquirers affirm it, yet the Writers of Minerals and natural speculators, are of another belief: conceiving the stones which bear this name, to be a Mineral concretion; not to be found in animals, but in fields. And therefore *Bætius* refers it to *Asteria* or some kind of *Lapis stellaris*, and plainly concludeth, *reperiuntur in agris, quos tamen alii in annosis ac qui diu in Arundinetis inter rubos sentesque delituerunt bufonis capitibus generari pertinaciter affirmant*.

Lastly, If any such thing there be, yet must it not, for ought I see, be taken as we receive it, for a loose and moveable stone, but rather a concretion or induration of the crany it self; for being of an earthy temper, living in the earth, and as some say feeding thereon, such indurations may sometimes happen. Thus when *Brassavolus* after a long search had discovered one, he affirms it was rather the forehead bone petrified, then a stone within the crany; and of this belief was *Gesner*. Which is also much confirmed from what is delivered in *Aldrovandus*, upon experiment of very many Toads, whose

crannies or sculls in time grew hard, and almost of a stony substance. All which considered, we must with circumspection receive those stones which commonly bear this name, much less believe the traditions, that in envy to mankind they are cast out, or swallowed down by the Toad; which cannot consist with *Anatomy*, and with the rest, enforced this censure from *Bætius*, *Ab eo tempore pro nugis habui quod de Bufonio lapide, ejusque origine traditur.*

What therefore best reconcileth these divided determinations, may be a middle opinion; that of these stones some may be mineral, and to be found in the earth; some animal, to be met with in Toads, at least by the induration of their crannies. The first are many and manifold, to be found in *Germany* and other parts; the last are fewer in number, and in substance not unlike the stones in Crabs heads. This is agreeable unto the determination of *Aldrovandus* De Mineral. lib. 4. Musæi Calceolariani, Sect. 3., and is also the judgment of learned *Spigelius* in his Epistle unto *Pignorius*.

But these Toadstones, at least very many thereof, which are esteemed among us, are at last found to be taken not out of Toads heads, but out of a Fishes mouth, being handsomely contrived out of the teeth of the *Lupus Marinus*, a Fish often taken in our Northern Seas, as was publicly declared by an eminent and learned Physitian. Sir *George Ent.* But because men are unwilling to conceive so low of their Toadstones which they so highly value, they may make some trial thereof by a candent hot Iron applied unto the hollow and unpolished part thereof, whereupon if they be true stones they will not be apt to burn or afford a burnt odour, which they may be apt to do, if contrived out of animal parts or the teeth of fishes.

Concerning the generation of Frogs, we shall briefly deliver that account which observation hath taught us. By Frogs I understand not such as arising from putrefaction, are bred without copulation, and because they subsist not long, are called *Temporariæ*; nor do I mean the little Frog of an excellent Parrat green, that usually sits on Trees and Bushes, and is therefore called *Ranunculus viridis*, or *arboreus*; but hereby I understand the aquatile or Water-Frog, whereof in ditches and standing plashes we may behold many millions every Spring in *England*. Now these do not as *Pliny* conceiveth, exclude black pieces of flesh, which after become Frogs; but they let fall their spawn in the water, of excellent use in Physick, and scarce unknown unto any. In this spawn of a lentous and transparent body, are to be discerned many specks, or little conglobulations, which in a small time become of deep black, a substance more compacted and terrestrious then the other; for it riseth not in distillation, and affords a powder when the white and aqueous part is exhaled. Now of this black or dusky substance is the Frog at last formed; as we have beheld, including the spawn with water in a glass, and exposing it unto the Sun. For that black and round substance, in a few days began to dilate and grow longer, after a while the head, the eyes, the tail to be discernable, and at last to become that which the Ancients called *Gyrinus*, we a *Porwige* or Tadpole. This in some weeks after becomes a perfect Frog, the legs growing out before, and the tail wearing away, to supply the other behind; as may be observed in some which have newly forsaken the water; for in such, some part of the tail will be seen, but curtailed and short, not long and finny as before. A part provided them a while to swim and move in the water, that is, untill such time as Nature excluded legs, whereby they might be provided not only to swim in the water, but move upon the land, according to the amphibious *Amphibious Animals*, such as live in both elements of land and water. and mixt intention of Nature, that is, to live in both. So that whoever observeth the first progression of the seed before motion, or shall take notice of the strange indistinction of parts in the Tadpole, even when it moveth about, and how successively the inward parts do seem to discover themselves, until their last perfection; may easily discern the high curiosity of Nature in these inferiour animals, and what a long line is run to make a Frog.

And because many affirm, and some deliver, that in regard it hath lungs and breatheth, a Frog may be easily drowned; though the reason be probable, I find not the experiment answerable; for fasting one about a span under water, it lived almost six days. Nor is it only hard to destroy one in water, but difficult also at land: for it will live long after the lungs and heart be out; how long it will

live in the seed, or whether the spawn of this year being preserved, will not arise into Frogs in the next, might also be enquired: and we are prepared to trie.

## CHAPTER XIV Of the Salamander

That a Salamander is able to live in flames, to endure and put out fire, is an assertion, not only of great antiquity, but confirmed by frequent, and not contemptible testimony. The *Egyptians* have drawn it into their Hieroglyphicks, *Aristotle* seemeth to embrace it; more plainly *Nicander*, *Sarenus Sammonicus*, *Ælian* and *Pliny*, who assigns the cause of this effect: An Animal (saith he) so cold that it extinguisheth the fire like Ice. All which notwithstanding, there is on the negative, Authority and Experience; *Sextius* a Physitian, as *Pliny* delivereth, denied this effect; *Dioscorides* affirmed it a point of folly to believe it; *Galen* that it endureth the fire a while, but in continuance is consumed therein. For experimental conviction, *Mathiolus* affirmeth, he saw a Salamander burnt in a very short time; and of the like assertion is *Amatus Lusitanus*; and most plainly *Pierius*, whose words in his Hieroglyphicks are these: *Whereas it is commonly said that a Salamander extinguisheth fire, we have found by experience, that it is so far from quenching hot coals, that it dieth immediately therein.* As for the contrary assertion of *Aristotle*, it is but by hear say, as common opinion believeth, *Hæc enim (ut aiunt) ignem ingrediens, eum extinguit;* and therefore there was no absurdity in *Galen*, when as a Septical medicine *A corruptive Medicine destroying the parts like Arsenike.* he commended the ashes of a Salamander; and *Magicians* in vain from the power of this Tradition, at the burning of Towns or Houses expect a relief from Salamanders.

The ground of this opinion, might be some sensible resistance of fire observed in the Salamander: which being, as *Galen* determineth, cold in the fourth, and moist in the third degree, and having also a mucous humidity above and under the skin, by vertue thereof it may a while endure the flame: which being consumed, it can resist no more. Such an humidity there is observed in Newtes, or Water-Lizards, especially if their skins be perforated or pricked. Thus will Frogs and Snails endure the Flame: thus will whites of Eggs, vitreous or glassie flegm extinguish a coal: thus are unguents made which protect a while from the fire: and thus beside the *Hirpini* there are later stories of men that have passed untoucht through the fire. And therefore some truth we allow in the tradition: truth according unto *Galen*, that it may for a time resist a flame, or as *Scaliger* avers, extinguish or put out a coal: for thus much will many humid bodies perform: but that it perseveres and lives in that destructive element, is a fallacious enlargement. Nor do we reasonably conclude, because for a time it endureth fire, it subdueth and extinguisheth the same, because by a cold and aluminous moisture, it is able a while to resist it: from a peculiarity of Nature it subsisteth and liveth in it.

It hath been much promoted by Stories of incombustible napkins and textures which endure the fire, whose materials are called by the name of Salamanders wool. Which many too literally apprehending, conceive some investing part, or tegument of the Salamander: wherein beside that they mistake the condition of this Animal (which is a kind of Lizard, a quadruped corticated and depilous, that is, without wool, fur, or hair) they observe not the method and general rule of nature; whereby all Quadrupeds oviparous, as Lizards, Frogs, Tortois, Chamelions, Crocodiles, are without hair, and have no covering part or hairy investment at all. And if they conceive that from the skin of the Salamander, these incremable pieces are composed; beside the experiments made upon the living, that of *Brassavolus* will step in, who in the search of this truth, did burn the skin of one dead.

Nor is this Salamanders wooll desumed from any Animal, but a Mineral substance Metaphorically so called from this received opinion. For beside *Germanicus* his heart *Suetonius.*, and *Pyrrhus* his great Toe, *Plutarch.* which would not burn with the rest of their bodies, there are in the number of Minerals some bodies incombustible; more remarkably that which the ancients named *Asbeston*, and *Pancirollus* treats of in the Chapter of *Linum vivum.* Whereof by art were weaved Napkins, Shirts, and Coats, inconsumable by fire; and wherein in ancient times to preserve their ashes pure, and without commixture, they burnt the bodies of Kings. A Napkin hereof *Pliny* reports that

*Nero* had, and the like saith *Paulus Venetus* the Emperour of *Tartary* sent unto Pope *Alexander*; and also affirms that in some part of *Tartary* there were Mines of Iron whose filaments were weaved into incombustible cloth. Which rare Manufacture, although delivered for lost by *Pancirollus*, yet *Salmuth* his Commentator affirmeth, that one *Podocaterus* a Cyprian, had shewed the same at *Venice*; and his materials were from *Cyprus*, where indeed *Dioscorides* placeth them; the same is also ocularly confirmed by *Vives* upon *Austin*, and *Maiolus* in his Colloquies. And thus in our days do men practise to make long-lasting Snasts for Lamps out of *Alumen plumosum*; and by the same we read in *Pausanius*, that there always burnt a Lamp before the Image of *Minerva*.

## CHAPTER XV Of the Amphisbæna

That the Amphisbæna, that is, a smaller kind of Serpent, which moveth forward and backward, hath two heads, or one at either extream, was affirmed first by *Nicander*, and after by many others, by the Author of the Book *De Theriaca ad Pisonem*, ascribed unto *Galen*; more plainly *Pliny*, *Geminum habet caput, tanquam parum esset uno ore effundi venenum*: but *Ælian* most confidently, who referring the conceit of *Chimera* and *Hydra* unto Fables, hath set down this as an undeniable truth.

Whereunto while men assent, and can believe a bicapitous conformation in any continued species, they admit a gemination of principle parts, not naturally discovered in any Animal. True it is that other parts in Animals are not equal; for some make their progression with many legs, even to the number of an hundred, as *Juli*, *Scolopendræ*; or such as are termed *Centipedes*: some fly with two wings, as Birds and many Insects, some with four, as all farinaceous or mealy-winged Animals, as Butterflies, and Moths: all vaginipennous or sheath-winged Insects, as Beetles and Dorrs. Some have three Testicles, as *Aristotle* speaks of the Buzzard; and some have four stomachs, as horned and ruminating Animals; but for the principle parts, the Liver, Heart, and especially the brains; regularly they are but one in any kind or species whatsoever.

And were there any such species or natural kind of animal, it would be hard to make good those six positions of body, which according to the three dimensions are ascribed unto every Animal: that is, *infra*, *supra*, *ante*, *retro*, *dextrosum*, *sinistrosum*: for if (as it is determined) that be the anterior and upper part, wherein the senses are placed, and that the posterior and lower part which is opposite thereunto, there is no inferiour or former part in this Animal; for the senses being placed at both extreams, doth make both ends anterior, which is impossible; the terms being Relative, which mutually subsist, and are not without each other. And therefore this duplicity was ill contrived to place one head at both extreams, and had been more tolerable to have settled three or four at one. And therefore also Poets have been more reasonable then Philosophers, and *Geryon* or *Cerberus* less monstrous than *Amphisbæna*.

Again, if any such thing there were, it were not to be obtruded by the name of *Amphisbæna*, or as an Animal of one denomination; for properly that Animal is not one, but multiplicious or many, which hath a duplicity or gemination of principal parts. And this doth *Aristotle* define, when he affirmeth a monster is to be esteemed one or many, according to its principle, which he conceived the heart, whence he derived the original of Nerves, and thereto ascribed many acts which Physitians assign unto the brain: and therefore if it cannot be called one, which hath a duplicity of hearts in his sense, it cannot receive that appellation with a plurality of heads in ours. And this the practice of Christians hath acknowledged, who have baptized these geminous births, and double connascencies with several names, as conceiving in them a distinction of souls, upon the divided execution of their functions; that is, while one wept, the other laughing; while one was silent, the other speaking; while one awaked, the other sleeping; as is declared by three remarkable examples in *Petrarch*, *Vincentius* and the *Scottish* History of *Buchanan*.

It is not denied there have been bicapitous Serpents with the head at each extream, for an example hereof we find in *Aristotle*, and of the like form in *Aldrovandus* we meet with the Icon of a Lizzard; and of this kind perhaps might that *Amphisbæna* be, the picture whereof *Cassianus Puteus* shewed unto the learned *Faber*. Which double formations do often happen unto multiparous generations, more especially that of Serpents; whose productions being numerous, and their Eggs in chains or links together (which sometime conjoin and inoculate into each other) they may unite into various shapes and come out in mixed formations. But these are monstrous productions, beside the intention of Nature, and the statutes of generation, neither begotten of like parents, nor begetting the like again, but irregularly produced, do stand as Anomalies in the general Book of Nature. Which

being shifts and forced pieces, rather than genuine and proper effects, they afford us no illation; nor is it reasonable to conclude, from a monstrosity unto a species, or from accidental effects, unto the regular works of Nature.

Lastly, The ground of the conceit was the figure of this Animal, and motion oft-times both ways; for described it is to be like a worm, and so equally framed at both extrems, that at an ordinary distance it is no easie matter to determine which is the head; and therefore some observing them to move both ways, have given the appellation of heads unto both extrems, which is no proper and warrantable denomination; for many Animals with one head, do ordinarily perform both different and contrary Motions; Crabs move sideling, Lobsters will swim swiftly backward, Worms and Leeches will move both ways; and so will most of those Animals, whose bodies consist of round and annular fibers, and move by undulation; that is, like the waves of the Sea, the one protruding the other, by inversion whereof they make a backward Motion.

Upon the same ground hath arisen the same mistake concerning the Scolopendra or hundred-footed Insect, as is delivered by *Rhodiginus* from the Scholiast of *Nicander*: *Dicitur à Nicandro, ἀμφικαρχῆς, id est dicephalus aut biceps fictum vero, quoniam retrorsum (ut scribit Aristoteles), arrepat,* observed by *Aldrovandus*, but most plainly by *Muffetus*, who thus concludeth upon the Text of *Nicander*: *Tamen pace tanti authoris dixerim, unicum illi duntaxat caput licet pari facilitate, prorsum capite, retrorsum ducente cauda, incedat, quod Nicandro aliisque imposuisse dubito:* that is, under favour of so great an Author, the *Scopolendra* hath but one head, although with equal facility it moveth forward and backward, which I suspect deceived *Nicander*, and others.

And therefore we must crave leave to doubt of this double-headed Serpent until we have the advantage to behold or have an iterated ocular testimony concerning such as are sometimes mentioned by *American* relators; and also such as *Cassianus Puteus* shewed in a picture to *Johannes Faber*; and that which is set down under the name of *Amphisbæna Europæa* in his learned discourse upon *Hernandez* his History of *America*.

## CHAPTER XVI

### Of the Viper

That the young Vipers force their way through the bowels of their Dam, or that the female Viper in the act of generation bites off the head of the male, in revenge whereof the young ones eat through the womb and belly of the female, is a very ancient tradition. In this sense entertained in the Hieroglyphicks of the *Egyptians*; affirmed by *Herodotus*, *Nicander*, *Pliny*, *Plutarch*, *Ælian*, *Jerome*, *Basil*, *Isidore*, seems countenanced by *Aristotle*, and his Scholar *Theophrastus*: from hence is commonly assigned the reason why the *Romans* punished *Parricides* by drowning them in a Sack with a Viper. And so perhaps upon the same opinion the men of *Melita* when they saw a Viper upon the hand of *Paul*, said presently without conceit of any other sin, *No doubt this man is a murderer, who though he have escaped the Sea, yet vengeance suffereth him not to live*: that is, he is now paid in his own way, the parricidous Animal and punishment of murderers is upon him. And though the tradition were currant among the Greeks, to confirm the same the Latine name is introduced, *Vipera quasi vi pariat*; That passage also in the Gospel, *O ye generation of Vipers!* hath found expositions which countenance this conceit. Notwithstanding which authorities, transcribed relations and conjectures, upon enquiry we find the same repugnant unto experience and reason.

And first, it seems not only injurious unto the providence of Nature, to ordain a way of production which should destroy the producer, or contrive the continuation of the species by the destruction of the Continuator; but it overthrows and frustrates the great Benediction of God, Gen. 1. *God blessed them, saying, Be fruitful and multiply*. Now if it be so ordained that some must regularly perish by multiplication, and these be the fruits of fructifying in the Viper; it cannot be said that God did bless, but curse this Animal: *Upon thy belly shalt thou go, and dust shalt thou eat all thy life*, was not so great a punishment unto the Serpent after the fall, as *encrease, be fruitful and multiply*, was before. This were to confound the Maledictions of God, and translate the curse of the Woman upon the Serpent: that is, *in dolore paries, in sorrow shalt thou bring forth*; which being proper unto the Woman, is verified best in the Viper, whose delivery is not only accompanied with pain, but also with death it self. And lastly, it overthrows the careful course, and parental provision of Nature, whereby the young ones newly excluded are sustained by the Dam, and protected until they grow up to a sufficiency for themselves. All which is perverted in this eruptive generation: for the Dam being destroyed, the younglings are left to their own protection: which is not conceivable they can at all perform, and whereof they afford us a remarkable continuance many days after birth. For the young one supposed to break through the belly of the Dam, will upon any fright for protection run into it; for then the old one receives them in at her mouth, which way the fright being past, they will return again, which is a peculiar way of refuge; and although it seem strange, is avowed by frequent experience and undeniable testimony.

As for the experiment, although we have thrice attempted it, it hath not well succeeded; for though we fed them with Milk, Bran, Cheese, etc., the females always died before the young ones were mature for this eruption; but rest sufficiently confirmed in the experiments of worthy enquirers. Wherein to omit the ancient conviction of *Apollonius*, we shall set down some few of Modern Writers. *That Vipers exclude their young ones by an ordinary passage, as other viviparous creatures*. The first, of *Amatus Lusitanus* in his Comment upon *Dioscorides*, *Vidimus nos viperas prægnantes inclusas pixedibus parere, quæ inde ex partu nec mortuæ, nec visceribus perforatæ manserunt*. The second is that of *Scaliger*, *Viperas ab impatientibus moræ fætibus numerosissimis rumpi atque interire falsum esse scimus, qui in Vincentii Camerini circulatoris lignea theca vidimus, enatas viperellas, parente salva*. The last and most plain of *Franciscus Bustamantinus*, a Spanish Physitian of *Alcala de Henares*, whose words in his third *de Animantibus Scripturæ*, are these: *Cum vero per me et per alios hæc ipsa disquisissem servata Viperina progenie, etc.*: that is, when by my self and others I had enquired the

truth hereof, including Vipers in a glass, and feeding them with Cheese and Bran, I undoubtedly found that the Viper was not delivered by the tearing of her bowels; but I beheld the young ones excluded by the passage of generation, near the orifice of the seidge. Whereto we might also add the ocular confirmation of *Lacuna upon Dioscorides, Ferdinandus Imperatus*, and that learned Physician of *Naples, Aurelius Severinus*.

Now although the Tradition be untrue, there wanted not many grounds which made it plausibly received. The first was a favourable indulgence and special contrivance of Nature; which was the conceit of *Herodotus*, who thus delivereth himself. Fearful Animals, and such as serve for food, Nature hath made more fruitful; but upon the offensive and noxious kind, she hath not conferred fertility. So the Hare that becometh a prey unto Man, unto Beasts, and Fowls of the air, is fruitful even to superfætation; but the Lion, a fierce and ferocious Animal hath young ones but seldom, and also but one at a time; Vipers indeed although destructive are fruitful; but lest their number should increase, Providence hath contrived another way to abate it: for in copulation the female bites off the head of the male, and the young ones destroy the mother. But this will not consist with reason, as we have declared before. And if we more nearly consider the condition of Vipers and noxious Animals we shall discover an higher provision of Nature: how although in their paucity she hath not abridged their malignity, yet hath she notoriously effected it by their secession or latitancy. For not only offensive insects, as Hornets, Wasps, and the like; but sanguineous corticated Animals, as Serpents, Toads and Lizzards, do lie hid and betake themselves to coverts in the Winter. Whereby most Countries enjoying the immunity of *Ireland* and *Candie*, there ariseth a temporal security from their venoms; and an intermission of their mischiefs, mercifully requiting the time of their activities.

A second ground of this effect, was conceived the justice of Nature, whereby she compensates the death of the father by the matricide or murder of the mother: and this was the expression of *Nicander*. But the cause hereof is as improbable as the effect; and were indeed an improvident revenge in the young ones, whereby in consequence, and upon defect of provision they must destroy themselves. And whereas he expresseth this decollation of the male by so full a term as ἀποκόπτειν, that is, to cut or lop off, the act is hardly conceiveable; for the Viper hath but two considerable teeth, and those so disposed, so slender and needle-pointed, that they are apter for puncture then any act of incision. And if any like action there be, it may be only some fast retention or sudden compression in the *Orgasmus* or fury of their lust; according as that expression of *Horace* is construed concerning *Lydia* and *Telephus*.

– Sive puer furens,  
Impressit memorem dente labris notam.

Others ascribe this effect unto the numerous conception of the Viper; and this was the opinion of *Theophrastus*. Who though he denieth the exesion or forcing through the belly, conceiveth nevertheless that upon a full and plentiful impletion there may perhaps succeed a disruption of the matrix, as it happeneth sometimes in the long and slender fish *Acus. Needle-fish, found sometimes upon the Sea-shore, consisting of four lines unto the vent, and six from thence unto the head*. Now although in hot Countries, and very numerous conceptions, in the Viper or other Animals, there may sometimes ensue a dilaceration of the genital parts; yet is this a rare and contingent effect, and not a natural and constant way of exclusion. For the wise Creator hath formed the organs of Animals unto their operations, and in whom he ordaineth a numerous conception, in them he hath prepared convenient receptacles, and a sutable way of exclusion.

Others do ground this disruption upon their continued or protracted time of delivery, presumed to last twenty days; whereat excluding but one a day, the latter brood impatient, by a forcible prurruption anticipate their period of exclusion; and this was the assertion of *Pliny, Cæteri tarditatis impatientes prorumpunt latera, occisâ parente*; which was occasioned upon a mistake of the Greek

Text in *Aristotle*, τίκτει δὲ ἐν μία ἡμέρα καθ' ἓν, τίκτει δὲ πλείω ἢ εἴκοσιν, which are literally thus translated, *Parit autem una die secundum unum, parit autem plures quam viginti*, and may be thus Englished, *She bringeth forth in one day, one by one, and sometimes more than twenty*: and so hath *Scaliger* rendered it, *Sigillatim parit absolvit, una die, interdum plures quam viginti*: But *Pliny*, whom *Gaza* followeth, hath differently translated it, *Singulos diebus singulis parit, numero ferè viginti*; whereby he extends the exclusion unto twenty days, which in the textuary sense is fully accomplished in one.

But what hath most advanced it, is a mistake in another text of *Aristotle*, which seemeth directly to determine this disruption, τίκτει μικρὰ ἐχίδια ἐν ὑμέσιν, αἱ περιρρήγνυνται τριταῖοι, ἐνίστε δὲ καὶ ἔσωθεν διαφραγόντα αὐτὰ ἐξέρχεται, which *Gaza* hath thus translated, *Purit catulos abvolutos membranis quæ tertio die rumpuntur, evenit interdum ut qui in utero adhuc sunt abrosis membranis prorumpant*. Now herein probably *Pliny*, and many since have been mistaken; for the disruption of the membranes or skins, which include the young ones, conceiving a dilaceration of the matrix and belly of the Viper: and concluding from a casual dilaceration, a regular and constant disruption.

As for the Latine word *Vipera*, which in the Etymologie of *Isidore* promoteth this conceit; more properly it may imply *vivipera*. For whereas other Serpents lay Eggs, the Viper excludeth living Animals; and though the *Cerastes* be also viviparous, and we have found formed Snakes in the belly of the *Cicilia* or Slow-worm; yet may the Viper emphatically bear the name. For the notation or Etymology is not of necessity adequate unto the name; and therefore though animal be deduced from *anima*, yet are there many animations beside, and Plants will challenge a right therein as well as sensible Creatures.

As touching the Text of Scripture, and compellation of the *Pharisees*, by Generation of Vipers, although constructions be made hereof conformable to this Tradition; and it may be plausibly expounded, that out of a viperous condition, they conspired against their Prophets, and destroyed their spiritual parents; yet (as *Jansenius* observeth) *Gregory* and *Jerome*, do make another construction; apprehending thereby what is usually implied by that Proverb, *Mali corvi, malum ovum*; that is, of evil parents, an evil generation, a posterity not unlike their majority; of mischievous progenitors, a venomous and destructive progeny.

And lastly, Concerning the Hieroglyphical account, according to the Vulgar conception set down by *Orus Apollo*, the Authority thereof is only Emblematical; for were the conception true or false, to their apprehensions, it expressed filial impiety. Which strictly taken, and totally received for truth, might perhaps begin, but surely promote this conception.

More doubtful assertions have been raised of no Animal then the Viper, as we have dispersedly noted: and *Francisco Redi* hath amply discovered in his noble observations of Vipers; from good reasons and iterated experiments affirming, that a Viper containeth no humour, excrement, or part which either dranke or eat, is able to kill any: that the *remorsores* or dog-teeth, are not more than two in either sex: that these teeth are hollow, and though they bite and prick therewith, yet are they not venomous, but only open a way and entrance unto the poyson, which notwithstanding is not poysonous except it touch or attain unto the bloud. And that there is no other poison in this Animal, but only that almost insipid liquor like oyl of Almonds, which stagnates in the sheaths and cases that cover the teeth; and that this proceeds not from the bladder of gall, but is rather generated in the head, and perhaps demitted and sent from thence into these cases by salival conducts and passages, which the head communicateth unto them.

## CHAPTER XVII Of Hares

The double sex of single Hares, or that every Hare is both male and female, beside the vulgar opinion, was the affirmative of *Archelaus*, of *Plutarch*, *Philostratus*, and many more. Of the same belief have been the Jewish *Rabbins*; The same is likewise confirmed from the Hebrew word; *Arnabeth*. which, as though there were no single males of that kind, hath only obtained a name of the feminine gender. As also from the symbolical foundation of its prohibition in the law, *Levit.* 11. and what vices therein are figured; that is, not only pusillanimity and timidity from its temper, feneration or usury from its foecundity and superfetation; but from this mixture of sexes, unnatural venery and degenerated effemination. Nor are there hardly any who either treat of mutation or mixtion of sexes, who have not left some mention of this point; some speaking positively, others dubiously, and most resigning it unto the enquiry of the Reader. Now hereof to speak distinctly, they must be male and female by mutation and succession of sexes; or else by composition, mixture or union thereof.

*Transmutation of Sexes, viz. of Women into Men, granted.*

As for the mutation of sexes, or transition into one another, we cannot deny it in Hares, it being observable in Man. For hereof beside *Empedocles* or *Tiresias*, there are not a few examples: and though very few, or rather none which have emasculated or turned women, yet very many who from an esteem or reality of being Women have infallibly proved Men. Some at the first point of their menstruous eruptions, some in the day of their marriage, others many years after: which occasioned disputes at Law, and contestations concerning a restore of the dowry. And that not only mankind, but many other Animals may suffer this transexion, we will not deny, or hold it at all impossible: although I confess by reason of the postick and backward position of the feminine parts in quadrupedes, they can hardly admit the substitution of a protrusion, effectual unto masculine generation; except it be in Retromingents, and such as couple backward.

Nor shall we only concede the succession of sexes in some, but shall not dispute the transition of reputed species in others; that is, a transmutation, or (as *Paracelsians* term it) Transplantation of one into another. Hereof in perfect Animals of a congenerous seed, or near affinity of natures, examples are not unfrequent, as in Horses, Asses, Dogs, Foxes, Pheasants, Cocks, etc. but in imperfect kinds, and such where the discrimination of sexes is obscure, these transformations are more common; and in some within themselves without commixtion, as particularly in Caterpillars or Silkworms, wherein there is a visible and triple transfiguration. But in Plants, wherein there is no distinction of sex, these transplantations are conceived more obvious than any; as that of Barley into Oats, of Wheat into Darnel; and those grains which generally arise among Corn, as Cockle, Aracus, *Ægilops*, and other degenerations; which come up in unexpected shapes, when they want the support and maintenance of the primary and master-forms. And the same do some affirm concerning other Plants in less analogy of figures; as the mutation of Mint into Cresses, Basil into Serpoile, and Turneps into Radishes. In all which, as *Severinus* conceiveth, In *Idea Medicinæ Philosophicæ*. there may be equivocal seeds and Hermaphroditical principles, which contain the radicality and power of different forms; thus in the seed of Wheat there lieth obscurely the seminality of Darnel, although in a secondary or inferiour way, and at some distance of production; which nevertheless if it meet with convenient promotion, or a conflux and conspiracy of causes more powerful than the other, it then beginneth to edifie in chief, and contemning the superintendent form, produceth the signatures of its self.

Now therefore although we deny not these several mutations, and do allow that Hares may exchange their sex, yet this we conceive doth come to pass but sometimes, and not in that vicissitude or annual alteration as is presumed. That is, from imperfection to perfection, from perfection to imperfection; from female unto male, from male to female again, and so in a circle to both without a

permansion in either. For beside the inconceivable mutation of temper, which should yearly alternate the sex, this is injurious unto the order of nature, whose operations do rest in the perfection of their intents; which having once attained, they maintain their accomplished ends, and relapse not again into their progressional imperfections. So if in the minority of natural vigor, the parts of seminality take place; when upon the encrease or growth thereof the masculine appear, the first design of nature is atchieved, and those parts are after maintained.

But surely it much impeacheth this iterated transexion of Hares, if that be true which *Cardan* and other Physicians affirm, that Transmutation of sex is only so in opinion; and that these transfeminated persons were really men at first; although succeeding years produced the manifesto or evidence of their virilities. Which although intended and formed, was not at first excluded: and that the examples hereof have undergone no real or new transexion, but were Androgynally born, and under some kind of *Hermaphrodites*. For though *Galen* do favour the opinion, that the distinctiv parts of sexes are only different in Position, that is, inversion or protrusion; yet will this hardly be made out from the Anatomy of those parts. The testicles being so seated in the female, that they admit not of protrusion; and the neck of the matrix wanting those parts which are discoverable in the organ of virility.

The second and most received acception, is, that Hares are male and female by conjunction of both sexes; and such as are found in mankind, Poetically called Hermaphrodites; supposed to be formed from the equality, or *non victorie* of either seed; carrying about them the parts of Man and Woman; although with great variety in perfection, site and ability; not only as *Aristotle* conceived, with a constant impotency in one; but as later observers affirm, sometimes with ability of either venery. And therefore the providence of some Laws have thought good, that at the years of maturity they should elect one sex, and the errors in the other should suffer a severer punishment. Whereby endeavouring to prevent incontinency, they unawares enjoyed perpetual chastity; for being executive in both parts, and confined unto one, they restrained a natural power, and ordained a partial virginity. *Plato* and some of the Rabbins proceeded higher; who conceived the first Man an Hermaphrodite; and *Marcus Leo* the learned *Jew*, in some sense hath allowed it; affirming that *Adam* in one suppositum without division, contained both Male and Female. And therefore whereas it is said in the text, That God created man in his own Image, in the Image of God created he him, male and female created he them: applying the singular and plural unto *Adam*, it might denote, that in one substance, and in himself he included both sexes, which was after divided, and the female called Woman. The opinion of *Aristotle* extendeth farther, from whose assertion all men should be Hermaphrodites; for affirming that Women do not spermatize, and confer a place or receptacle rather than essential principles of generation, he deductively includes both sexes in mankind; for from the father proceed not only males and females, but from him also must Hermaphroditical and masculo-feminine generations be derived, and a commixtion of both sexes arise from the seed of one. But the Schoolmen have dealt with that sex more hardly than any other; who though they have not much disputed their generation, yet have they controverted their Resurrection, and raisen a querie, whether any at the last day should arise in the sex of Women; as may be observed in the supplement of *Aquinas*.

Now as we must acknowledge this Androgynal condition in Man, *Consisting of man and woman*. so can we not deny the like doth happen in beasts. Thus do we read in *Pliny*, that *Neroes* Chariot was drawn by four Hermaphroditical Mares, and *Cardan* affirms he also beheld one at *Antwerp*. And thus may we also concede, that Hares have been of both sexes, and some have ocularly confirmed it; but that the whole species or kind should be bisexous or double-sexed, we cannot affirm, who have found the parts of male and female respectively distinct and single in any wherein we have enquired: And the like success had *Bacchinus* Bacch. De Hermaphroditis. in such as he dissected. And whereas it is conceived, that being an harmless Animal and delectable food unto man, nature hath made them with double sexes, that actively and passively performing they might more numerously increase; we forget an higher providence of nature whereby she especially promotes the multiplication

of Hares, which is by superfetation; that is, a conception upon a conception, or an improvement of a second fruit before the first be excluded; preventing hereby the usual intermission and vacant time of generation; which is very common and frequently observable in Hares, mentioned long ago by *Aristotle*, *Herodotus*, and *Pliny*; and we have often observed, that after the first cast, there remain successive conceptions, and other younglings very immature, and far from their term of exclusion.

Superfetation possible in women, and that unto a perfect birth.

Nor need any man to question this in Hares, for the same we observe doth sometime happen in Women; for although it be true, that upon conception the inward orifice of the matrix exactly closeth, so that it commonly admitteth nothing after; yet falleth it out sometime, that in the act of coition, the avidity of that part dilateth it self, and receiveth a second burden; which if it happen to be near in time unto the first, they do commonly both proceed unto perfection, and have legitimate exclusions, periodically succeeding each other. But if the superfetation be made with considerable intermission, the latter most commonly proves abortive; for the first being confirmed, engrosseth the aliment from the other. However therefore the project of *Julia* seem very plausible, and that way infallible, when she received not her passengers, before she had taken in her lading, yet was there a fallibility therein: nor indeed any absolute security in the policy of adultery after conception. For the Matrix (which some have called another Animal within us, and which is not subjected unto the law of our will) after reception of its proper Tenant, may yet receive a strange and spurious inmate. As is confirmable by many examples in *Pliny*; by *Larissæa* in *Hippocrates* and that merry one in *Plautus* urged also by *Aristotle*: that is, of *Iphicles* and *Hercules*, the one begat by *Jupiter*, the other by *Amphitryon* upon *Alemæna* as also in those super-conceptions, where one child was like the father, the other like the adulterer, the one favoured the servant, the other resembled the master.

Now the grounds that begat, or much promoted the opinion of a double sex in Hares, might be some little bags or tumours, at first glance representing stones or Testicles, to be found in both sexes about the parts of generation; which men observing in either sex, were induced to believe a masculine sex in both. But to speak properly, these are no Testicles or parts official unto generation, but glandulous substances that seem to hold the nature of Emunctories. For herein may be perceived slender perforations, at which may be expressed a black and fæculent matter. If therefore from these we shall conceive a mixtion of sexes in Hares, with fairer reason we may conclude it in Bevers; whereof both sexes contain a double bag or Tumour in the groin, commonly called the Cod of *Castor*, as we have delivered before.

Another ground were certain holes or cavities observable about the siedge; which being perceived in Males, made some conceive there might be also a fœminine nature in them. And upon this very ground, the same opinion hath passed upon the Hyæna, and is declared by *Aristotle*, and thus translated by *Scaliger*; *Quod autem aiunt utriusque sexus habere genitalia, falsum est, quod videtur esse fœmineum sub cauda est simile figura fœminino, verum pervium non est*; and thus is it also in Hares, in whom these holes, although they seem to make a deep cavity, yet do they not perforate the skin, nor hold a community with any part of generation: but were (as *Pliny* delivereth) esteemed the marks of their age, the number of those deciding their number of years. In which opinion what truth there is we shall not contend; for if in other Animals there be authentick notations, if the characters of years be found in the horns of Cows, or in the Antlers of Deer; if we conjecture the age of Horses from joints in their docks, and undeniably presume it from their teeth; we cannot affirm, there is in this conceit, any affront unto nature; although who ever enquireth shall find no assurance therein.

The last foundation was Retromingency or pissing backward; for men observing both sexes to urine backward, or aversly between their legs, they might conceive there was a fœminine part in both; wherein they are deceived by the ignorance of the just and proper site of the Pizzel, or part designed unto the Excretion of urine; which in the Hare holds not the common position, but is aversly seated, and in its distention enclines unto the Coccix or Scut. Now from the nature of this position,

there ensueth a necessity of Retrocopulation, which also promoteth the conceit: for some observing them to couple without ascension, have not been able to judge of male or female, or to determine the proper sex in either. And to speak generally, this way of copulation is not appropriate unto Hares, nor is there one, but many ways of coition: according to divers shapes and different conformations. For some couple laterally or sidewise, as Worms: some circularly or by complication, as Serpents: some pronely, that is, by contaction of the ventral parts in both, as Apes, Porcupines, Hedgehogs, and such as are termed Mollia, as the Cuttle-fish and the Purple; some mixtly, that is, the male ascending the female, or by application of the ventral parts of the one, unto the postick parts of the other, as most Quadrupeds: Some aversly, as all Crustaceous Animals, Lobsters, Shrimps, and Crevises, and also Retromingents, as Panthers, Tygers, and Hares. This is the constant Law of their Coition, this they observe and transgress not: onely the vitiosity of man hath acted the varieties hereof; nor content with a digression from sex or species, hath in his own kind run thorow the Anomalies of venery; and been so bold, not only to act, but represent to view, the irregular ways of Lust.

## CHAPTER XVIII Of Moles, or Molls

That Moles are blind and have no eyes, though a common opinion, is received with much variety; some affirming only they have no sight, as *Oppianus*, the Proverb *Talpa Cæcior*, and the word *σπαλαχία*, or *Talpitas*, which in *Hesychius* is made the same with *Cæcitas*: some that they have eyes, but no sight, as the text of *Aristotle* seems to imply; some neither eyes nor sight, as *Albertus*, *Pliny*, and the vulgar opinion; some both eyes and sight, as *Scaliger*, *Aldrovandus*, and some others. Of which opinions the last with some restriction, is most consonant unto truth: for that they have eyes in their head is manifest unto any, that wants them not in his own: and are discoverable, not only in old ones, but as we have observed in young and naked conceptions, taken out of the belly of the Dam. And he that exactly enquires into the cavity of their cranies, may perhaps discover some propagation of nerves communicated unto these parts. But that the humours together with their coats are also distinct (though *Galen* seem to affirm it) transcendeth our discovery; for separating these little Orbs, and including them in magnifying Glasses, we discerned no more then *Aristotle* mentions, τῶν ὀφθαλμῶν μέλαινα, that is, a black humour, nor any more if they be broken. That therefore they have eyes we must of necessity affirm; but that they be comparatively incomplete we need not to deny: So *Galen* affirms the parts of generation in women are imperfect, in respect of those of men, as the eyes of Moles in regard of other Animals; So *Aristotle* terms them *πηρουμένους*, which *Gaza* translates *Oblæsos*, and *Scaliger* by a word of imperfection *inchoatos*.

Now as that they have eyes is manifest unto sense, so that they have sight not incongruous unto reason; if we call not in question the providence of this provision, that is, to assign the Organs, and yet deny the Office, to grant them eyes and withhold all manner of vision. For as the inference is fair, affirmatively deduced from the action to the Organ, that they have eyes because they see; so is it also from the organ to the action, that they have eyes, therefore some sight designed, if we take the intention of Nature in every species, and except the casual impediments, or morbosities in individuals. But as their eyes are more imperfect then others, so do we conceive of their sight or act of vision, for they will run against things, and hudling forwards fall from high places. So that they are not blind, nor yet distinctly see; there is in them no Cecity, yet more then a Cecutiency; they have sight enough to discern the light, though not perhaps to distinguish of objects or colours; so are they not exactly blind, for light is one object of vision. And this (as *Scaliger* observeth) might be as full a sight as Nature first intended, for living in darkness under the earth, they had no further need of eyes then to avoid the light; and to be sensible when ever they lost that darkness of earth, which was their natural confinement. And therefore however Translators do render the word of *Aristotle* or *Galen*, that is, *imperfectos oblæsos* or *inchoatos*, it is not much considerable; for their eyes are sufficiently begun to finish this action, and competently perfect for this imperfect Vision.

And lastly, although they had neither eyes nor sight, yet could they not be termed blind. For blindness being a privative term unto sight, this appellation is not admittible in propriety of speech, and will overthrow the doctrine of privations; which presuppose positive forms or habits, and are not indefinite negations, denying in all subjects, but such alone wherein the positive habits are in their proper Nature, and placed without repugnancy. So do we improperly say a Mole is blind, if we deny it the Organs or a capacity of vision from its created Nature; so when the text of *John* had said, that person was blind from his nativity, whose cecity our Saviour cured, it was not warrantable in *Nonnus* to say he had no eyes at all, as in the judgment of *Heinsius*, he describeth in his paraphrase; and as some ancient Fathers affirm, that by this miracle they were created in him. And so though the sense may be accepted, that Proverb must be candidly interpreted, which maketh fishes Mute; and calls them silent which have no voice in Nature.

Now this conceit is erected upon a misapprehension or mistake in the symptoms of vision; men confounding abolishment, diminution and depravement, and naming that an abolition of sight, which indeed is but an abatement. For if vision be abolished, it is called *cæcitas*, or blindness; if depraved and receive its objects erroneously, Hallucination; if diminished, *hebetudo visus*, *caligatio*, or dimness. Now instead of a diminution or imperfect vision in the Mole, we affirm an abolition or total privation; instead of a caligation or dimness, we conclude a cecity or blindness. Which hath been frequently inferred concerning other Animals; so some affirm the Water-Rat is blind, so *Sammonicus* and *Nicander* do call the Mus-Araneus the shrew or Ranny, blind: And because darkness was before light, the *Ægyptians* worshipped the same. So are *Cæciliæ* or Slow-worms accounted blind, and the like we affirm proverbially of the Beetle; although their eyes be evident, and they will flye against lights, like many other Insects, and though also *Aristotle* determines, that the eyes are apparent in all flying Insects, though other senses be obscure, and not perceptible at all. And if from a diminution we may infer a total privation, or affirm that other Animals are blind which do not acutely see, or comparatively unto others, we shall condemn unto blindness many not so esteemed; for such as have corneous or horney eyes, as Lobsters and crustaceous Animals, are generally dim-sighted; all Insects that have *antennæ*, or long horns to feel out their way, as Butterflies and Locusts; or their forelegs so disposed, that they much advance before their heads, as may be observed in Spiders; and if the Eagle were judge, we might be blind our selves. The expression therefore of Scripture in the story of *Jacob* is surely with circumspection: And it came to pass when *Jacob* was old, and his eyes were dim, *quando caligarunt oculi*, saith *Jerome* and *Tremellius*, which are expressions of diminution, and not of absolute privation.

Other concerns there are of Molls, which though not commonly opinioned are not commonly enough considered: As the peculiar formation of their feet, the slender *ossa Iugalia*, and Dogteeth, and how hard it is to keep them alive out of the Earth: As also the ferity and voracity of these animals; for though they be contented with Roots, and stringy parts of Plants, or Wormes under ground, yet when they are above it will sometimes tear and eat one another, and in a large glass wherein a Moll, a Toad, and a Viper were inclosed, we have known the Moll to dispatch them and to devour a good part of them both.

## CHAPTER XIX Of Lampries

Whether Lampries have nine eyes, as is received, we durst refer it unto *Polyphemus*, who had but one, to judge it. An error concerning eyes, occasioned by the error of eyes; deduced from the appearance of diverse cavities or holes on either side, which some call eyes that carelessly behold them; and is not only refutable by experience, but also repugnant unto Reason. For beside the monstrosity they fasten unto Nature, in contriving many eyes, who hath made but two unto any Animal, that is, one of each side, according to the division of the brain; it were a superfluous inartificial act to place and settle so many in one plane; for the two extreame would sufficiently perform the office of sight without the help of the intermediate eyes, and behold as much as all seven joyned together. For the visible base of the object would be defined by these two; and the middle eyes, although they behold the same thing, yet could they not behold so much thereof as these; so were it no advantage unto man to have a third eye between those two he hath already; and the fiction of *Argus* seems more reasonable then this; for though he had many eyes, yet were they placed in circumference and positions of advantage, and so are they placed in several lines in Spiders.

Again, These cavities which men call eyes are seated out of the head, and where the Gills of other fish are placed; containing no Organs of sight, nor having any Communication with the brain. *All sense is from the brain.* Now all sense proceeding from the brain, and that being placed (as *Galen* observeth) in the upper part of the body, for the fitter situation of the eyes, and conveniency required unto sight; it is not reasonable to imagine that they are any where else, or deserve that name which are seated in other parts. And therefore we relinquish as fabulous what is delivered of *Sternoptalmi*, or men with eyes in their breast, and when it is said by *Solomon*, A wise mans eyes are in his head, it is to be taken in a second sense, and affordeth no objection. True it is that the eyes of Animals are seated with some difference, but in sanguineous animals in the head, and that more forward then the ear or hole of hearing. In quadrupedes, in regard of the figure of their heads, they are placed at some distance; in latirostrous and flat-bill'd birds they are more laterally seated, and therefore when they look intently they turn one eye upon the object, and can convert their heads to see before and behind, and to behold two opposite points at once. But at a more easie distance are they situated in man, and in the same circumference with the ear; for if one foot of the compass be placed upon the Crown, a circle described thereby will intersect, or pass over both the ears.

To what use the nine eyes in a Lamprie do serve.

The error in this conceit consists in the ignorance of these cavities, and their proper use in nature; for this is a particular disposure of parts, and a peculiar conformation whereby these holes and sluces supply the defect of Gills, and are assisted by the conduit in the head; for like cetaceous Animals and Whales, the Lamprie hath a fistula, spout or pipe at the back part of the head, whereat it spurts out water. Nor is it only singular in this formation, but also in many other; as in defect of bones, whereof it hath not one; and for the spine or backbone, a cartilaginous substance without any spondyles, processes or protuberance whatsoever. As also in the provision which Nature hath made for the heart; which in this Animal is very strangely secured, and lies immured in a cartilage or gristly substance. And lastly, in the colour of the liver: which is in the Male of an excellent grass-green: but of a deeper colour in the Female, and will communicate a fresh and durable verdure.

## CHAPTER XX Of Snayls

Whether *Snayls* have eyes some Learned men have doubted. For *Scaliger* terms them but imitations of eyes; and *Aristotle* upon consequence denyeth them, when he affirms that *Testaceous* Animals have no eyes. But this now seems sufficiently asserted by the help of exquisite Glasses, which discover those black and atramentous spots or globales to be their eyes.

That they have two eyes is the common opinion, but if they have two eyes, we may grant them to have no less than four, that is, two in the larger extensions above, and two in the shorter and lesser horns below, and this number may be allowed in these inferiour and exanguious animals; since we may observe the articulate and latticed eyes in Flies, and nine in some Spiders: And in the great *Phalangium* Spider of *America*, we plainly number eight.

But in sanguineous animals, quadrupeds, bipeds, or man, no such number can be regularly verified, or multiplicity of eyes confirmed. And therefore what hath been under this kind delivered, concerning the plurality, paucity or anomalous situation of eyes, is either monstrous, fabulous, or under things never seen includes good sense or meaning. And so may we receive the figment of *Argus*, who was an Hieroglyphick of heaven, in those centuries of eyes expressing the stars; and their alternate wakings, the vicissitude of day and night. Which strictly taken cannot be admitted; for the subject of sleep is not the eye, but the common sense, which once asleep, all eyes must be at rest. And therefore what is delivered as an Embleme of vigilancy, that the Hare and Lion do sleep with one eye open, doth not evince they are any more awake then if they were both closed. For the open eye beholds in sleep no more then that which is closed; and no more one eye in them then two in other Animals that sleep with both open; as some by disease, and others naturally which have no eye-lids at all.

How things happen to be seen as double.

As for *Polyphemus*, although the story be fabulous, the monstrosity is not impossible. For the act of Vision may be performed with one eye; and in the deception and fallacy of sight, hath this advantage of two, that it beholds not objects double, or sees two things for one. For this doth happen when the axis of the visive cones, diffused from the object, fall not upon the same plane; but that which is conveyed into one eye, is more depressed or elevated then that which enters the other. So if beholding a Candle, we protrude either upward or downward the pupill of one eye, the object will appear double; but if we shut the other eye, and behold it with one, it will their appear but single; and if we abduce the eye unto either corner, the object will not duplicate: for in that position the axis of the cones remain in the same plane, as is demonstrated in the opticks, and delivered by *Galen*, in his tenth *De usu partium*.

Relations also there are of men that could make themselves invisible, which belongs not to this discourse: but may serve as notable expressions of wise and prudent men, who so contrive their affairs, that although their actions be manifest, their designs are not discoverable. In this acception there is nothing left of doubt, and *Giges* Ring remaineth still amongst us: for vulgar eyes behold no more of wise men then doth the Sun: they may discover their exterior and outward ways, but their interior and inward pieces he only sees, that sees into their beings.

## CHAPTER XXI Of the Chameleon

Concerning the *Chameleon* there generally passeth an opinion that it liveth only upon air, and is sustained by no other aliment: Thus much is in plain terms affirmed by *Solinus*, *Pliny*, and others, and by this periphrasis is the same described by *Ovid*. All which notwithstanding, upon enquiry I find the assertion mainly controvertible, and very much to fail in the three inducements of belief.

And first for its verity, although asserted by some, and traditionally delivered by others, yet is it very questionable. For beside *Ælian*, who is seldom defective in these accounts; *Aristotle* distinctly treating hereof, hath made no mention of this remarkable propriety: which either suspecting its verity, or presuming its falsity, he surely omitted: for that he remained ignorant of this account it is not easily conceivable: it being the common opinion, and generally received by all men. Some have positively denied it, as *Augustinus*, *Niphus*, *Stobæus*, *Dalechampius*, *Fortunius Licetus*, with many more; others have experimentally refuted it, as namely *Johannes Landius*, who in the relation of *Scaliger*, observed a *Chameleon* to lick up a fly from his breast: But *Bellonius Comment. in Ocell. Lucan.* hath been more satisfactorily experimental, not only affirming they feed on Flies, Caterpillars, Beetles and other Insects, but upon exenteration he found these Animals in their bellies: whereto we might also add the experimental decisions of the worthy *Peireschius* and learned *Emanuel Vizzanius*, in that *Chameleon* which had been often observed to drink water, and delight to feed on Meal-worms. And although we have not had the advantage of our own observation, yet have we received the like confirmation from many ocular spectators.

As touching the verisimilitude or probable truth of this relation, several reasons there are which seem to overthrow it. For first, there are found in this Animal, the guts, the stomach, and other parts official unto nutrition; which were its aliment the empty reception of air, their provisions had been superfluous. Now the wisdom of nature abhorring superfluities, and effecting nothing in vain, unto the intention of these operations, respectively contriveth the Organs; and therefore where we find such Instruments, we may with strictness expect their actions; and where we discover them not, we may with safety conclude the non-intention of their operations. So when we perceive that Bats have teats, it is not unreasonable to infer they suckle their younglings with milk; but whereas no other flying Animal hath these parts, we cannot from them expect a viviparous exclusion; but either a generation of eggs, or some vermiparous separation, whose navel is within it self at first, and its nutrition after not connexedly depending of its original.

Again, Nature is so far from leaving any one part without its proper action, that she oft-times imposeth two or three labours upon one, so the Pizel in Animals is both official unto Urine and to generation, but the first and primary use is generation; for some creatures enjoy that part which urine not. So the nostrils are useful both for respiration and smelling, but the principal use is smelling; for many have nostrils which have no lungs, as fishes, but none have lungs or respiration, which have not some shew, or some analogy of nostrils. *Nature provides no part without its proper function or office.* Thus we perceive the providence of Nature, that is, the wisdom of God, which disposeth of no part in vain, and some parts unto two or three uses, will not provide any without the execution of its proper office, nor where there is no digestion to be made, make any parts inservient to that intention.

Beside the remarkable teeth, the tongue of this animal is a second argument to overthrow this airy nutrification: and that not only in its proper nature, but also its peculiar figure. For of this part properly taken there are two ends; that is, the formation of the voice, and the execution of tast; for the voice, it can have no office in *Chameleons*, for they are mute Animals; as beside fishes, are most other sorts of Lizards. As for their tast, if their nutriment be air, neither can it be an Instrument thereof; for the body of that element is ingustible, void of all sapidity, and without any action of the tongue, is by the rough artery or wezon conducted into the lungs. And therefore *Pliny* much forgets the strictness

of his assertion, when he alloweth excrements unto that Animal, that feedeth only upon Air; which notwithstanding with the urine of an Ass, he commends as a magicall Medicine upon our enemies.

The figure of the tongue seems also to overthrow the presumption of this aliment, which according to exact delineation, is in this Animal peculiar, and seemeth contrived for prey. For in so little a creature it is at the least a palm long, and being it self very slow in motion, hath in this part a very great agility; withall its food being flies and such as suddenly escape, it hath in the tongue a mucous and slimy extremity, whereby upon a sudden emission it inviscates and tangleth those Insects. And therefore some have thought its name not unsuitable unto its nature; the nomination in Greek is a little Lion; χαυμαλιέων. not so much for the resemblance of shape, as affinity of condition; that is for vigilancy in its prey, and sudden rapacity thereof, which it performeth not like the Lion with its teeth, but a sudden and unexpected ejaculation of the tongue. This exposition is favoured by some, especially the old gloss upon *Leviticus*, whereby in the Translation of *Jerome* and the Septuagint, this Animal is forbidden; what ever it be, it seems as reasonable as that of *Isidore*, who derives this name à *Camelo et Leone*, as presuming herein resemblance with a Camell.

As for the possibility hereof, it is not also unquestionable; and wise men are of opinion, the bodies of Animals cannot receive a proper aliment from air; for beside that tast being (as *Aristotle* terms it) a kind of touch; it is required the aliment should be tangible, and fall under the palpable affections of touch; beside also that there is some sapor in all aliments, as being to be distinguished and judged by the gust; which cannot be admitted in air: Beside these, I say, if we consider the nature of aliment, and the proper use of air in respiration, it will very hardly fall under the name hereof, or properly attain the act of nutrication.

#### Requisites unto Nutrition.

And first concerning its nature, to make a perfect nutrition into the body nourished, there is required a transmutation of the nutriment, now where this conversion or aggeneration is made, there is also required in the aliment a familiarity of matter, and such a community or vicinity unto a living nature, as by one act of the soul may be converted into the body of the living, and enjoy one common soul. Which cannot be effected by air, it concurring only with our flesh in common principles, which are at the largest distance from life, and common also unto inanimated constitutions. And therefore when it is said by *Fernelius*, and asserted by divers others, that we are only nourished by living bodies, and such as are some way proceeding from them, that is, the fruits, effects, parts, or seeds thereof; they have laid out an object very agreeable unto assimilation; for these indeed are fit to receive a quick and immediate conversion, as holding some community with our selves, and containing approximate dispositions unto animation.

Secondly, (as is argued by *Aristotle* against the *Pythagoreans*) whatsoever properly nourisheth before its assimilation, by the action of natural heat it receiveth a corpulency or incrassation progressional unto its conversion; which notwithstanding cannot be effected upon air; for the action of heat doth not condense but rarifie that body, and by attenuation, rather than for nutrition, disposeth it for expulsion.

Thirdly, (which is the argument of *Hippocrates*) all aliment received into the body, must be therein a considerable space retained, and not immediately expelled. Now air but momentarily remaining in our bodies, it hath no proportionable space for its conversion; only of length enough to refrigerate the heart; which having once performed, lest being it self heated again, it should suffocate that part, it maketh no stay, but hasteth back the same way it passed in.

Fourthly, The use of air attracted by the lungs, and without which there is no durable continuation in life, is not the nutrition of parts, but the contemperation and ventilation of that fire always maintained in the forge of life; whereby although in some manner it concurreth unto nutrition, yet can it not receive the proper name of nutriment. And therefore by *Hippocrates* De Alimento. it is termed *Alimentum non Alimentum*, a nourishment and no nourishment. That is, in a large acception,

but not in propriety of language; conserving the body, not nourishing the same; nor repairing it by assimilation, but preserving it by ventilation; for thereby the natural flame is preserved from extinction, and so the individuuum supported in some way like nutrition.

And though the air so entreth the Lungs, that by its nitrous Spirit doth affect the heart, and several ways qualifie the blood; and though it be also admitted into other parts, even by the meat we chew, yet that it affordeth a proper nutriment alone, it is not easily made out.

Again, Some are so far from affirming the air to afford any nutriment, that they plainly deny it to be any Element, or that it entreth into mixt bodies as any principle in their compositions, but performeth other offices in the Universe; as to fill all vacuities about the earth or beneath it, to convey the heat of the sun, to maintain fires and flames, to serve for the flight of volatils, respiration of breathing Animals, and refrigeration of others. And although we receive it as an Element, yet since the transmutation of Elements and simple bodies, is not beyond great question, since also it is no easie matter to demonstrate that air is so much as convertible into water; *Wherein Vapour is commonly mistaken for air.* how transmutable it is into flesh, may be of deeper doubt.

And although the air attracted may be conceived to nourish the invisible flame of life, in as much as common and culinary flames are nourished by the air about them; we make some doubt whether air is the pabulous supply of fire, much less that flame is properly air kindled. And the same before us, hath been denied by the Lord of *Verulam*, in his Tract of Life and Death, and also by Dr. *Jorden* in his book of Mineral waters. *What the matter of Culinary or Kitchin fire is.* For that which substantially maintaineth the fire, is the combustible matter in the kindled body, and not the ambient air, which affordeth exhalation to its fuliginous atomes; nor that which causeth the flame properly to be termed air, but rather as he expresseth it, the accension of fuliginous exhalations, which contain an unctuousity in them, and arise from the matter of fuel, which opinion will salve many doubts, whereof the common conceit affordeth no solution.

As first, How fire is stricken out of flints? that is, not by kindling the air from the collision of two hard bodies; for then Diamonds should do the like better than Flints: but rather from sulphureous inflamed and even vitrified effluvioms and particles, as hath been observed of late. The like saith *Jorden* we observe in canes and woods, that are unctuous and full of oyl, which will yield fire by frication, or collision, not by kindling the air about them, but the inflamable oyl within them. *Why fire goes out commonly wanting air, and why sometimes continued many ages in flame without fuel.* Why the fire goes out without air? that is, because the fuliginous exhalations wanting evaporation recoil upon the flame and choak it, as is evident in cupping glasses; and the artifice of charcoals, where if the air be altogether excluded, the fire goes out. Why some lamps included in those bodies have burned many hundred years, as that discovered in the Sepulchre of *Tullia*, the sister of *Cicero*, and that of *Olibius* many years after, near *Padua*? because whatever was their matter, either a preparation of gold, or *Naptha*, the duration proceeded from the purity of their oyl which yielded no fuliginous exhalations to suffocate the fire; For if air had nourished the flame, it had not continued many minutes, for it would have been spent and wasted by the fire. Why a piece of flax will kindle, though it touch not the flame? because the fire extendeth further, then indeed it is visible, being at some distance from the week, a pellucide and transparent body, and thinner then the air it self. Why Mettals in their liquation, although they intently heat the air above their surface, arise not yet into a flame, nor kindle the air about them? because their sulphur is more fixed, and they emit not inflamable exhalations. And lastly, why a lamp or candle burneth only in the air about it, and inflameth not the air at a distance from it? because the flame extendeth not beyond the inflamable effluence, but closely adheres unto the original of its inflammation; and therefore it only warmeth, not kindleth the air about it. Which notwithstanding it will do, if the ambient air be impregnate with subtile inflamabilities, and such as are of quick accension; as experiment is made in a close room; upon an evaporation of spirits of wine and Camphire; as subterraneous fires do sometimes happen, and as *Creusa* and *Alexanders* boy in the bath were set on fire by *Naptha*.

Lastly, The Element of air is so far from nourishing the body, that some have questioned the power of water; many conceiving it enters not the body in the power of aliment, or that from thence there proceeds a substantial supply. For beside that some creatures drink not at all; Even unto our selves, and more perfect Animals, though many ways assistent thereto, it performs no substantial nutrition, serving for refrigeration, dilution of solid aliment, and its elixation in the stomach; which from thence as a vehicle it conveys through less accessible cavities, and so in a rorid substance through the capillary cavities, into every part; which having performed, it is afterward excluded by Urine, sweat and serous separations. And this opinion surely possessed the Ancients; for when they so highly commended that water which is suddenly hot and cold, which is without all savour, the lightest, the thinnest, and which will soonest boil Beans or Pease, they had no consideration of nutrition; whereunto had they had respect, they would have surely commended gross and turbid streams, in whose confusion at least, there might be contained some nutriment; and not jejune or limped water, nearer the simplicity of its Element. Although, I confess, our clearest waters and such as seem simple unto sense, are much compounded unto reason, as may be observed in the evaporation of large quantities of water; wherein beside a terreous residence some salt is also found, as is also observable in rain water; which appearing pure and empty, is full of seminal principles, and carrieth vital atomes of plants and Animals in it, which have not perished in the great circulation of nature; *A seed of plants and animals contained in rain-water. Zibavius, tom. 4.* Chym.as may be discovered from several Insects generated in rain water, from the prevalent fructification of plants thereby; and (beside the real plant of *Cornerius*) from vegetable figurations, upon the sides of glasses, so rarely delineated in frosts.

All which considered, severer heads will be apt enough to conceive the opinion of this Animal, not much unlike that of the Astomi, or men without mouths, in *Pliny*; sutable unto the relation of the Mares in *Spain*, and their subventaneous conceptions, from the Western wind; and in some way more unreasonable then the figment of *Rabican* the famous horse in *Ariosto*, which being conceived by flame and wind, never tasted grass, or fed on any grosser provender then air; for this way of nutrition was answerable unto the principles of his generation. Which being not airy, but gross and seminal in the *Chameleon*; unto its conservation there is required a solid pasture, and a food congenerous unto the principles of its nature.

The grounds of this opinion are many; the first observed by *Theophrastus*, was the inflation or swelling of the body, made in this Animal upon inspiration or drawing in its breath; which people observing, have thought it to feed upon air. But this effect is rather occasioned upon the greatness of its lungs, which in this Animal are very large, and by their backward situation, afford a more observable dilation; and though their lungs be less, the like inflation is also observable in Toads, but especially in Sentortoises.

A second is the continual hiation or holding open its mouth, which men observing, conceive the intention thereof to receive the aliment of air; but this is also occasioned by the greatness of its lungs; for repletion whereof not having a sufficient or ready supply by its nostrils; it is enforced to dilate and hold open the jaws.

The third is the paucity of blood observed in this Animal, scarce at all to be found but in the eye, and about the heart; which defect being observed, inclined some into thoughts, that the air was a sufficient maintenance for these exanguious parts. But this defect or rather paucity of blood, is also agreeable unto many other Animals, whose solid nutriment we do not controvert; as may be observed in other sorts of Lizards, in Frogs and divers Fishes; and therefore an Horse-leech will not readily fasten upon every fish; and we do not read of much blood that was drawn from Frogs by Mice, in that famous battel of *Homer*.

The last and most common ground which begat or promoted this opinion, is the long continuation hereof without any visible food, which some observing, precipitously conclude they eat not at all. It cannot be denied it is (if not the most of any) a very abstemious Animal, and such as by reason of its frigidty, paucity of blood, and latitancy in the winter (about which time the observations

are often made) will long subsist without a visible sustentation. But a like condition may be also observed in many other Animals; for Lizards and Leeches, as we have made trial, will live some months without sustenance; and we have included Snails in glasses all winter, which have returned to feed again in the spring. Now these notwithstanding, are not conceived to pass all their lives without food; for so to argue is fallacious, and is moreover sufficiently convicted by experience. And therefore probably other relations are of the same verity, which are of the like affinity; as is the conceit of the *Rhintace* in *Persia*, the *Canis Levis* of *America*, and the *Manucodiata* or bird of Paradise in *India*.

To assign a reason of this abstinence in Animals, or declare how without a supply there ensueth no destructive exhaustion, exceedeth the limits and intention of my discourse. *Fortunius Licetus* in his excellent Tract, *de his qui diu vivunt sine alimento*, hath very ingeniously attempted it; deducing the cause hereof from an equal conformity of natural heat and moisture, at least no considerable exuperancy in either; which concurring in an unactive proportion, the natural heat consumeth not the moisture (whereby ensueth no exhaustion) and the condition of natural moisture is able to resist the slender action of heat (whereby it needeth no reparation) and this is evident in Snakes, Lizards, Snails, and divers Insects latitant many months in the year; which being cold creatures, containing a weak heat in a crass or copious humidity, do long subsist without nutrition. For the activity of the agent, being not able to overmaster the resistance of the patient, there will ensue no deperdition. And upon the like grounds it is, that cold and phlegmatick bodies, and (as *Hippocrates* determineth) that old men will best endure fasting. Now the same harmony and stationary constitution, as it happeneth in many species, so doth it fall out sometime in Individuals. For we read of many who have lived long without aliment; and beside deceits and impostures, there may be veritable Relations of some, who without a miracle, and by peculiarity of temper, have far out fasted *Elias*. Which notwithstanding doth not take off the miracle; for that may be miraculously effected in one, which is naturally causable in another. Some naturally living unto an hundred; unto which age, others notwithstanding could not attain without a miracle.

## CHAPTER XXII

### Of the Ostrich

The common opinion of the *Ostrich*, *Struthiocamelus* or *Sparrow-Camel* conceives that it digesteth Iron; and this is confirmed by the affirmations of many; beside swarms of others, *Rhodiginus* in his prelections taketh it for granted, *Johannes Langius* in his Epistles pleadeth experiment for it; the common picture also confirmeth it, which usually describeth this Animal with an horseshoe in its mouth. Notwithstanding upon enquiry we find it very questionable, and the negative seems most reasonably entertained; whose verity indeed we do the rather desire, because hereby we shall relieve our ignorance of one occult quality; for in the list thereof it is accounted, and in that notion imperiously obtruded upon us. For my part, although I have had the sight of this Animal, I have not had the opportunity of its experiment, but have received great occasion of doubt, from learned discourses thereon.

For *Aristotle* and *Oppianus* who have particularly treated hereof are silent in this singularity; either omitting it as dubious, or as the Comment saith, rejecting it as fabulous. *Pliny* speaketh generally, affirming only, the digestion is wonderful in this Animal; *Ælian* delivereth, that it digesteth stones without any mention of Iron; *Leo Africanus*, who lived in those Countries wherein they most abound, speaketh diminutively, and but half way into this assertion: *Surdum ac simplex animal est, quicquid invenit, absque delectu, usque ad ferrum devorat.* *Fernelius* in his second *De abditis rerum causis*, extenuates it, and *Riolanus* in his Comment thereof positively denies it. Some have experimentally refuted it, as *Albertus Magnus*; and most plainly *Ulysses Aldrovandus*, whose words are these: *Ego ferri frusta devorare, dum Tridenti essem, observavi, sed quæ incocta rursus excerneret*, that is, at my being at Trent, I observed the *Ostrich* to swallow Iron, but yet to exclude it undigested again.

Now beside experiment, it is in vain to attempt against it by Philosophical argument, it being an occult quality, which contemns the law of Reason, and defends it self by admitting no reason at all. *How (possibly) the stomach of the Ostrich may alter Iron.* As for its possibility we shall not at present dispute; nor will we affirm that Iron ingested, receiveth in the stomach of the *Ostrich* no alteration at all; but if any such there be, we suspect this effect rather from some way of corrosion, than any of digestion; not any liquid reduction or tendance to chilification by the power of natural heat, but rather some attrition from an acide and vitriolous humidity in the stomach, which may absterse and shave the scorious parts thereof. So rusty Iron crammed down the throat of a Cock, will become terse and clear again in its gizzard: So the Counter which according to the relation of *Amatus* remained a whole year in the body of a youth, and came out much consumed at last; might suffer this diminution, rather from sharp and acide humours, than the strength of natural heat, as he supposeth. So silver swallowed and retained some time in the body, will turn black, as if it had been dipped in *Aqua fortis*, or some corrosive water, but Lead will remain unaltered; for that mettal containeth in it a sweet salt or sugar, whereby it resisteth ordinary corrosion, and will not easily dissolve even in *Aqua fortis*. So when for medical uses, we take down the filings of Iron or Steel, we must not conceive it passeth unaltered from us; for though the grosser parts be excluded again, yet are the dissoluble parts extracted, whereby it becomes effectual in deopilations; and therefore for speedier operation we make extinctions, infusions, and the like, whereby we extract the salt and active parts of the Medicine; which being in solution, more easily enter the veins. *What the Chymists would have by their Aurum Potabile.* And this is that the Chymists mainly drive at in the attempt of their *Aurum Potabile*; that is, to reduce that indigestible substance into such a form as may not be ejected by siege, but enter the cavities, and less accessible parts of the body, without corrosion.

The ground of this conceit is its swallowing down fragments of Iron, which men observing, by a froward illation, have therefore conceived it digesteth them; which is an inference not to be admitted, as being a fallacy of the consequent, that is, concluding a position of the consequent, from

the position of the antecedent. For many things are swallowed by Animals, rather for condiment, gust or medicament, then any substantial nutriment. So Poultry, and especially the Turkey, do of themselves take down stones; and we have found at one time in the gizzard of a Turkey no less then seven hundred. Now these rather concur unto digestion, then are themselves digested; for we have found them also in the guts and excrements; but their descent is very slow, for we have given them stones and small pieces of Iron, which eighteen days after we have found remaining in the gizzard. And therefore the experiment of *Langius* and others might be fallible, whilst after the taking they expected it should come down within a day or two after. *How Cherry-stones may be thought to prevent surfets upon eating Cherries.* Thus also we swallow Cherry-stones, but void them unconcocted, and we usually say they preserve us from surfet; for being hard bodies they conceive a strong and durable heat in the stomach, and so prevent the crudities of their fruit: And upon the like reason do culinary operators observe, that flesh boiles best, when the bones are boiled with it. Thus dogs will eat grass, which they digest not: Thus Camels to make the water sapid, do raise the mud with their feet: Thus horses will knable at walls, Pigeons delight in salt stones. Rats will gnaw iron, and *Aristotle* saith the Elephant swalloweth stones. And thus may also the *Ostrich* swallow Iron; not as his proper aliment, but for the ends above expressed, and even as we observe the like in other Animals.

And whether these fragments of Iron and hard substances swallowed by the *Ostrich*, have not also that use in their stomachs, which they have in other birds; that is, in some way to supply the use of teeth, by commolition, grinding and compression of their proper aliment, upon the action of the strongly conformed muscles of the stomach; as the honor'd Dr. *Harvey* discourseth, may also be considered.

What effect therefore may be expected from the stomach of an *Ostrich* by application alone to further digestion in ours, beside the experimental refute of *Galen*, we refer it unto considerations above alledged; Or whether there be any more credit to be given unto the Medicine of *Ælian*, who affirms the stones they swallow have a peculiar vertue for the eyes, then that of *Hermolaus* and *Pliny* drawn from the urine of this Animal; let them determine who can swallow so strange a transmission of qualities, or believe that any Bird or flying Animal doth separately and distinctly urine beside the Bat.

That therefore an *Ostrich* will swallow and take down Iron, is easily to be granted: that oftentimes it pass entire away, if we admit of ocular testimony not to be denied. And though some experiment may also plead, that sometimes they are so altered, as not to be found or excluded in any discernable parcels: yet whether this be not effected by some way of corrosion, from sharp and dissolving humidities, rather then any proper digestion, chilifactive mutation, or alimental conversion, is with good reason doubted.

## CHAPTER XXIII Of Unicorns Horn

Great account and much profit is made of *Unicorns horn*, at least of that which beareth the name thereof; wherein notwithstanding, many I perceive suspect an Imposture, and some conceive there is no such Animal extant. Herein therefore to draw up our determinations; beside the several places of Scripture mentioning this Animal (which some may well contend to be only meant of the Rhinoceros *Some doubt to be made what קַרְנַיִם signifieth in Scripture.*) we are so far from denying there is any *Unicorn* at all, that we affirm there are many kinds thereof. In the number of Quadrupedes, we will concede no less then five; that is, the *Indian Ox*, the *Indian Ass*, the *Rhinoceros*, the *Oryx*, and that which is more eminently termed *Monoceros*, or *Unicornis*. Some of the list of fishes; as that described by *Olaus*, *Albertus* and others: and some Unicorns we will allow even among Insects; as those four kinds of nasicornous Beetles described by *Muffetus*.

Secondly, Although we concede there may be many *Unicorns*, yet are we still to seek; for whereunto to affix this Horn in question, or to determine from which thereof we receive this magnified Medicine, we have no assurance, or any satisfactory decision. For although we single out one, and eminently thereto assign the name of the *Unicorn*; yet can we not be secure what creature is meant thereby; what constant shape it holdeth, or in what number to be received. For as far as our endeavours discover, this animal is not uniformly described, but differently set forth by those that undertake it. *The Unicorn, how variously reported by Authors.* *Pliny* affirmeth it is a fierce and terrible creature; *Vartomannus* a tame and mansuete Animal: those which *Garcias ab Horto* described about the cape of good hope, were beheld with heads like horses; those which *Vartomannus* beheld, he described with the head of a Deer; *Pliny*, *Ælian*, *Solinus*, and after these from ocular assurance, *Paulus Venetus* affirmeth, the feet of the *Unicorn* are undivided, and like the Elephants: But those two which *Vartomannus* beheld at *Mecha*, were as he describeth, footed like a Goat. As *Ælian* describeth, it is in the bigness of an Horse, as *Vartomannus*, of a Colt; that which *Thevet* speaketh of was not so big as an Heifer; but *Paulus Venetus* affirmeth, they are but little less then Elephants. Which are discriminations very material, and plainly declare, that under the same name Authors describe not the same Animal: so that the *Unicorns Horn* of one, is not that of another, although we proclaim an equal vertue in all.

Thirdly, Although we were agreed what Animal this was, or differed not in its description, yet would this also afford but little satisfaction; for the Horn we commonly extol, is not the same with that of the Ancients. For that in the description of *Ælian* and *Pliny* was black: this which is shewed amongst us is commonly white, none black; and of those five which *Scaliger* beheld, though one spadiceous, or of a light red, and two enclining to red, yet was there not any of this complexion among them.

Fourthly, What Horns soever they be which pass amongst us, they are not surely the Horns of any one kind of Animal, but must proceed from several sorts of *Unicorns*. For some are wreathed, some not: That famous one which is preserved at St. *Dennis* near *Paris*, hath wreathy spires, and chockleary turnings about it, which agreeth with the description of the *Unicorns Horn* in *Ælian*. Those two in the treasure of St. *Mark* are plain, and best accord with those of the *Indian Ass*, or the descriptions of other *Unicorns*: That in the Repository of the electour of Saxone is plain and not hollow, and is believed to be a true Land *Unicorns Horn*. *Albertus Magnus* describeth one ten foot long, and at the base about thirteen inches compass: And that of *Antwerp* which *Goropius Becanus* describeth, is not much inferiour unto it; which best agree unto the descriptions of the *Sea-Unicorns*; for these, as *Olaus* affirmeth, are of that strength and bigness, as able to penetrate the ribs of ships. The same is more probable, because it was brought from Island, from whence, as *Becanus* affirmeth, three other were brought in his days: And we have heard of some which have been found by the

Sea-side, and brought unto us from *America*. So that while we commend the *Unicorns* Horn, and conceive it peculiar but unto one animal; under apprehension of the same vertue, we use very many; and commend that effect from all, which every one confineth unto some one he hath either seen or described.

Fifthly, Although there be many *Unicorns*, and consequently many Horns, yet many there are which bear that name, and currantly pass among us, which are no Horns at all. Such are those fragments and pieces of *Lapis Ceratites*, commonly termed *Cornu fossile*, whereof *Bætius* had no less than twenty several sorts presented him for *Unicorns* Horn. Hereof in subterraneous cavities, and under the earth there are many to be found in several parts of *Germany*; which are but the lapidescencies and petrifactive mutations of hard bodies; sometimes of Horn, of teeth, of bones, and branches of trees, whereof there are some so imperfectly converted, as to retain the odor and qualities of their originals; as he relateth of pieces of Ash and Walnut. Again, in most, if not all which pass amongst us, and are extolled for precious Horns, we discover not an affection common unto other Horns; that is, they mollifie not with fire, they soften not upon decoction or infusion, nor will they afford a jelly, or mucilaginous concretion in either; which notwithstanding we may effect in Goats horns, Sheeps, Cows and Harts-horn, in the Horn of the *Rhinoceros*, the horn of the *Pristis* or Sword fish. Nor do they become friable or easily powderable by Philosophical calcination, that is, from the vapor or steam of water, but split and rift contrary to others horns. *Unicorns Horn commonly used in England, what it is*. Briefly, many of those commonly received, and whereof there be so many fragments preserved in *England*, are not only no Horn, but a substance harder then a bone, that is, parts of the tooth of a Morse or Sea-horse; in the midst of the solider part contained a curdled grain, which is not to be found in Ivory. This in Northern Regions is of frequent use for hafts of knives or hilts of swords, and being burnt becomes a good remedy for fluxes: but Antidotally used, and exposed for *Unicorns* Horn, it is an insufferable delusion; and with more veniable deceit, it might have been practised in Harts-horn.

The like deceit may be practised in the teeth of other Sea-animals; in the teeth also of the *Hippopotamus*, or great Animal which frequenteth the River *Nilus*: For we read that the same was anciently used instead of Ivory or Elephants tooth. Nor is it to be omitted, what hath been formerly suspected, but now confirmed by *Olaus Wormius*, and *Thomas Bartholinus* and others, that those long Horns preserved as pretious rarities in many places, are but the teeth of Narhwales, to be found about Island, Greenland and other Northern regions; of many feet long, commonly wreathed, very deeply fastned in the upper jaw, and standing directly forward, graphically described in *BartholinusDe Unicornu.*, according unto one sent from a Bishop of Island, not separated from the crany. Hereof *Mercator* hath taken notice in his description of Island: some relations hereof there seem to be in *Purchas*, who also delivereth that the Horn at *Windsor*, was in his second voyage brought hither by *Frobisher*. These before the Northern discoveries, as unknown rarities, were carried by Merchants into all parts of *Europe*; and though found on the Sea-shore, were sold at very high rates; but are now become more common, and probably in time will prove of little esteem; and the bargain of *Julius* the third, be accounted a very hard one, who stuck not to give many thousand crowns for one.

Nor is it great wonder we may be so deceived in this, being daily gulled in the brother Antidote Bezoar; whereof though many be false, yet one there passeth amongst us of more intollerable delusion; somewhat paler then the true stone, and given by women in the extremity of great diseases, which notwithstanding is no stone, but seems to be the stony seed of some *Lithospermum* or greater *Grumwell*; or the *Lobus Echinatus* of *Clusius*, called also the Bezoar Nut; for being broken, it discovereth a kernel of a leguminous smell and tast, bitter like a Lupine, and will swell and sprout if set in the ground, and therefore more serviceable for issues, then dangerous and virulent diseases.

Sixthly, Although we were satisfied we had the *Unicorns* Horn, yet were it no injury unto reason to question the efficacy thereof, or whether those vertues pretended do properly belong unto it. For what we observe, (and it escaped not the observation of *Paulus Jovius* many years past) none of the

Ancients ascribed any medicinal or antidotal vertue unto the *Unicorns* Horn; and that which *Ælian* extolleth, who was the first and only man of the Ancients who spake of the medical vertue of any *Unicorn*, was the Horn of the *Indian* Ass; whereof, saith he, the Princes of those parts make bowls and drink therein, as preservatives against Poyson, Convulsions, and the Falling-sickness. Now the description of that Horn is not agreeable unto that we commend; for that (saith he) is red above, white below, and black in the middle; which is very different from ours, or any to be seen amongst us. And thus, though the description of the *Unicorn* be very ancient, yet was there of old no vertue ascribed unto it; and although this amongst us receive the opinion of the same vertue, yet is it not the same Horn whereunto the Antients ascribed it.

Lastly, Although we allow it an Antidotal efficacy, and such as the Ancients commended, yet are there some vertues ascribed thereto by Moderns not easily to be received; and it hath surely faln out in this, as other magnified medicines, whose operations effectual in some diseases, are presently extended unto all. That some Antidotal quality it may have, we have no reason to deny; for since Elks Hoofs and Horns are magnified for Epilepsies, since not only the bone in the heart, but the Horn of a Deer is Alexipharmacal, and ingredient into the confection of Hyacinth, and the Electuary of Maximilian; we cannot without prejudice except against the efficacy of this. *Expulsive of Poisons*. But when we affirm it is not only Antidotal to proper venoms, and substances destructive by qualities we cannot express; but that it resisteth also Sublimate, Arsenick, and poysons which kill by second qualities, that is, by corrosion of parts; I doubt we exceed the properties of its nature, and the promises of experiment will not secure the adventure. And therefore in such extremities, whether there be not more probable relief from fat oylly substances, which are the open tyrants over salt and corrosive bodies, then precious and cordial medicines which operate by secret and disputable proprieties; or whether he that swallowed Lime, and drank down Mercury water, did not more reasonably place his cure in milk, butter or oyl, then if he had recurred unto Pearl and Bezoar, common reason at all times, and necessity in the like case would easily determine.

Since therefore there be many *Unicorns*; since that whereto we appropriate a Horn is so variously described, that it seemeth either never to have been seen by two persons, or not to have been one animal; Since though they agreed in the description of the animal, yet is not the Horn we extol the same with that of the Ancients; Since what Horns soever they be that pass among us, they are not the Horns of one, but several animals; Since many in common use and high esteem are no Horns at all; Since if there were true Horns, yet might their vertues be questioned; Since though we allowed some vertues, yet were not others to be received; with what security a man may rely on this remedy, the mistress of fools hath already instructed some, and to wisdom (which is never to wise to learn) it is not too late to consider.

## CHAPTER XXIV

### That all Animals of the Land, are in theirkind in the Sea

That all Animals of the Land, are in their kind in the Sea, although received as a principle, is a tenent very questionable, and will admit of restraint. For some in the Sea are not to be matcht by any enquiry at Land, and hold those shapes which terrestrious forms approach not; as may be observed in the Moon-fish, or Orthragoriscus, the several sorts of Raia's, Torpedo's, Oysters, and many more, and some there are in the Land which were never maintained to be in the Sea, as Panthers, Hyæna's, Camels, Sheep, Molls, and others, which carry no name in Ichthyology *History of fishes.*, nor are to be found in the exact descriptions of *Rondoletius*, *Gesner*, or *Aldrovandus*.

Again, Though many there be which make out their nominations, as the Hedg-hog, Sea-serpents and others; yet are there also very many that bear the name of animals at Land, which hold no resemblance in corporal configuration; in which account we compute *Vulpecula*, *Canis*, *Rana*, *Passer*, *Cuculus*, *Asellus*, *Turdus*, *Lepus*, etc. Wherein while some are called the Fox, the Dog, the Sparrow or Frog-fish: and are known by common names with those at Land; yet as their describers attest, they receive not these appellations from a total similitude in figure, but any concurrence in common accidents, in colour, condition or single conformation. As for Sea-horses which much confirm this assertion; in their common descriptions, they are but Crotesco deliniations which fill up empty spaces in Maps, and meer pictorial inventions, not any Physical shapes: sutable unto those which (as *Pliny* delivereth) *Praxiteles* long ago set out in the Temple of *Domitius*. For that which is commonly called a Sea-horse, is properly called a Morse, and makes not out that shape. That which the Ancients named *Hippocampus* is a little animal about six inches long, and not preferred beyond the classis of Insects. That which they termed *Hippopotamus* an amphibious animal, about the River *Nile*, so little resembleth an horse, that as *Mathiolus* observeth, in all except the feet, it better makes out a swine. That which they termed a Lion, was but a kind of Lobster: that which they called the Bear, was but one kind of Crab: and that which they named *Bos marinus*, was not as we conceive a fish resembling an Ox, but a Skait or Thornback, so named from its bigness, expressed by the Greek word *Bous*, which is a prefix of augmentation to many words in that language.

And therefore although it be not denied that some in the water do carry a justifiable resemblance to some at Land, yet are the major part which bear their names unlike; nor do they otherwise resemble the creatures on earth, then they on earth the constellations which pass under animal names in heaven: nor the Dog fish at Sea much more make out the Dog of the Land, then that his cognominal or name-sake in the heavens. Now if from a similitude in some, it be reasonable to infer a correspondence in all, we may draw this analogy of animals upon plants; for vegetables there are which carry a near and allowable similitude unto animals. Fab. column. de stirp. rarioribus, Orchis, Cercopithecophora, Anthropophora. We might also conclude that animal shapes were generally made out in minerals: for several stones there are that bear their names in relation to animals or their parts, as *Lapis anguinus*, *Conchites*, *Echinites*, *Encephalites*, *Ægophthalmus*, and many more; as will appear in the Writers of Minerals, and especially in *Bœtius* and *Aldrovandus*.

Moreover if we concede, that the animals of one Element, might bear the names of those in the other, yet in strict reason the watery productions should have the prenomination: and they of the land rather derive their names, then nominate those of the Sea. For the watery plantations were first existent, and as they enjoyed a priority in form, had also in nature precedent denominations: but falling not under that Nomenclature of *Adam*, which unto terrestrious animals assigned a name appropriate unto their natures: from succeeding spectators they received arbitrary appellations: and were respectively denominatd unto creatures known at Land; who in themselves had independent names and not to be called after them, which were created before them.

Lastly, By this assertion we restrain the hand of God, and abridge the variety of the creation; making the creatures of one Element, but an acting over those of another, and conjoyning as it were the species of things which stood at distance in the intellect of God; and though united in the Chaos, had several seeds of their creation. For although in that indistinguishd mass, all things seemed one; yet separated by the voice of God, according to their species, they came out in incommunicated varieties, and irrelative seminalities, as well as divided places; and so although we say the world was made in six days, yet was there as it were a world in every one; that is, a distinct creation of distinguishd creatures; a distinction in time of creatures divided in nature, and a several approbation and survey in every one.

## CHAPTER XXV

Concerning the common course of Diet, in making choice of some Animals, and abstaining from eating others.

Why we confine our food unto certain Animals, and totally reject some others; how these distinctions crept into several Nations; and whether this practice be built upon solid reason, or chiefly supported by custom or opinion; may admit consideration.

For first there is no absolute necessity to feed on any; and if we resist not the stream of Authority, and several diductions from holy Scripture: there was no *Sarcophagie* before the flood; *Eating of Flesh*. and without the eating of flesh, our fathers from vegetable aliments, preserved themselves unto longer lives, then their posterity by any other. For whereas it is plainly said Gen. 1. 29., I have given you every herb which is upon the face of all the earth, and every tree, to you it shall be for meat; *The natural vertue of vegetables impaired by the deluge*. presently after the deluge, when the same had destroyed or infirmed the nature of vegetables, by an expression of enlargement, it is again delivered: Gen. 9. 3. Every moving thing that liveth, shall be meat for you, even as the green herb, have I given you all things.

And therefore although it be said that *Abel* was a Shepherd, and it be not readily conceived, the first men would keep sheep, except they made food thereof: great Expositors will tell us, that it was partly for their skins, wherewith they were cloathed, partly for their milk, whereby they were sustained; and partly for Sacrifices, which they also offered.

And though it may seem improbable, that they offered flesh, yet eat not thereof; and *Abel* can hardly be said to offer the firstlings of his flock, and the fat or acceptable part, if men used not to tast the same, whereby to raise such distinctions: some will confine the eating of flesh unto the line of *Cain*, who extended their luxury, and confined not unto the rule of God. That if at any time the line of *Seth* eat flesh, it was extraordinary, and only at their sacrifices; or else (as *Grotius* hinteth) if any such practice there were, it was not from the beginning; but from that time when the waies of men were corrupted, and whereof it is said, that the wickedness of mans heart was great; the more righteous part of mankind probably conforming unto the diet prescribed in Paradise, and the state of innocency. *Eating of Flesh (probably) not so common before the flood*. And yet however the practice of men conformed, this was the injunction of God, and might be therefore sufficient, without the food of flesh.

That they fed not on flesh, at least the faithful party before the flood, may become more probable, because they refrained the same for some time after. For so was it generally delivered of the golden age and reign of *Saturn*; which is conceived the time of *Noah*, before the building of *Babel*. And he that considereth how agreeable this is unto the traditions of the *Gentiles*; that that age was of one tongue: that *Saturn* devoured all his sons but three; that he was the son of *Oceanus* and *Thetis*; that a Ship was his Symbole; that he taught the culture of vineyards, and the art of husbandry, and was therefore described with a sickle, may well conceive, these traditions had their original in *Noah*. Nor did this practice terminate in him, but was continued at least in many after: as (beside the *Pythagoreans* of old, *Bannyans* now in *India*, who upon single opinions refrain the food of flesh) ancient records do hint or plainly deliver. Although we descend not so low, as that of *Æsclepiades* delivered by *Porphyrius*, περὶ ἀποχῆς. that men began to feed on flesh in the reign of *Pygmaleon* brother of *Dido*, who invented several torments, to punish the eaters of flesh.

Nor did men only refrain from the flesh of beasts at first, but as some will have it, beasts from one another. And if we should believe very grave conjecturers, carnivorous animals now, were not flesh devourers then, according to the expression of the divine provision for them. Gen. 1. 36. To every beast of the earth, and to every fowl of the air, I have given every green herb for meat, and it

was so. As is also collected from the store laid up in the Ark; wherein there seems to have been no fleshly provision for carnivorous Animals. For of every kind of unclean beast there went but two into the Ark: and therefore no stock of flesh to sustain them many days, much less almost a year.

But when ever it be acknowledged that men began to feed on flesh, yet how they betook themselves after to particular kinds thereof, with rejection of many others, is a point not clearly determined. As for the distinction of clean and unclean beasts, the original is obscure, and salveth not our practice. For no Animal is naturally unclean, or hath this character in nature; and therefore whether in this distinction there were not some mystical intention: *How Moses might distinguish beasts into clean and unclean before the flood.* whether *Moses* after the distinction made of unclean beasts, did not name these so before the flood by anticipation: whether this distinction before the flood, were not only in regard of sacrifices, as that delivered after was in regard of food: (for many were clean for food, which were unclean for sacrifice) or whether the denomination were but comparative, and of beasts less commodious for food, although not simply bad, is not yet resolved.

And as for the same distinction in the time of *Moses*, long after the flood, from thence we hold no restriction, as being no rule unto Nations beside the *Jews* in dietetical consideration, or natural choice of diet, they being enjoyned or prohibited certain foods upon remote and secret intentions. Especially thereby to avoid community with the Gentiles upon promiscuous commensality: or to divert them from the Idolatry of *Egypt* whence they came, they were enjoyned to eat the Gods of *Egypt* in the food of Sheep and Oxen. Withall in this distinction of Animals the consideration was hieroglyphical; in the bosom and inward sense implying an abstinence from certain vices symbolically intimated from the nature of those animals; as may be well made out in the prohibited meat of Swine, Cony, Owl, and many more.

At least the intention was not medical, or such as might oblige unto conformity or imitation; For some we refrain which that Law alloweth, as Locusts and many others; and some it prohibiteth, which are accounted good meat in strict and Medical censure: as (beside many fishes which have not finns and scales,) the Swine, Cony and Hare, a dainty dish with the Ancients; as is delivered by *Galen*, testified by *Martial*, Inter quadrupes mattya prima Lepus. as the popular opinion implied, that men grew fair by the flesh thereof: by the diet of *Cato*, that is Hare and Cabbage; and the *Jus nigrum*, or Black broth of the *Spartans*, which was made with the blood and bowels of an Hare.

And if we take a view of other Nations, we shall discover that they refrained many meats upon the like considerations. For in some the abstinence was symbolical; so *Pythagoras* enjoyned abstinence from fish: that is, luxurious and dainty dishes; So according to *Herodotus*, some *Egyptians* refrained swines flesh, as an impure and sordid animal: which whoever but touched, was fain to wash himself.

Some abstained superstitiously or upon religious consideration: So the *Syrians* refrained Fish and Pigeons; the *Egyptians* of old, Dogs, Eeles and Crocodiles; though *Leo Africanus* delivers, that many of late, do eat them with good gust: and *Herodotus* also affirmeth, that the *Egyptians* of *Elephantina* (unto whom they were not sacred,) did eat thereof in elder times: and Writers testify, that they are eaten at this day in *India* and *America*. And so, as *Cæsar* reports, Lib. 3. de bello Gall. unto the ancient *Britains* it was piaculous to tast a Goose, which dish at present no table is without.

Unto some Nations the abstinence was political and for some civil advantage: So the *Thessalians* refrained Storks, because they destroyed their Serpents; and the like in sundry animals is observable in other Nations.

And under all these considerations were some animals refrained: so the *Jews* abstained from swine at first symbolically, as an Emblem of impurity; and not for fear of the Leprosie, as *Tacitus* would put upon them. The *Cretians* superstitiously, upon tradition that *Jupiter* was suckled in that country by a Sow. Some *Egyptians* politically, because they supplied the labour of plowing by rooting up the ground. And upon like considerations perhaps the *Phœnicians* and *Syrians* fed not on this Animal: and as *Solinus* reports, the *Arabians* also and *Indians*. *Aul. Gell.* lib. 4. A great part of mankind

refraining one of the best foods, and such as *Pythagoras* himself would eat; who, as *Aristoxenus* records, refused not to feed on Pigs.

Certain dishes in great request with the Ancients, not so much esteemed now.

Moreover while we single out several dishes and reject others, the selection seems but arbitrary, or upon opinion; for many are commended and cryed up in one age, which are decayed and nauseated in another. Thus in the dayes of *Mecenas*, no flesh was preferred before young Asses; which notwithstanding became abominable unto succeeding appetites. At the table of *Heliogabalus* the combs of Cocks were an esteemed service; which country stomachs will not admit at ours. The Sumen or belly and dugs of swine with Pig, and sometimes beaten and bruised unto death: the womb of the same Animal, especially that was barren, or else had cast her young ones, though a tough and membranous part, was magnified by Roman Palats; whereunto nevertheless we cannot perswade our stomachs. How *Alec*, *Muria*, and *Garum*, would humour our gust I know not; but surely few there are that could delight in their *Cyceon*; that is, the common draught of Honey, Cheese, parcht Barley-flower, Oyl and Wine; which notwithstanding was commended mixture, and in high esteem among them. We mortifie our selves with the diet of fish, and think we fare courslly if we refrain from the flesh of other animals. But antiquity held another opinion hereof: When *Pythagoras* in prevention of luxury advised, not so much as to tast on fish. Since the *Rhodians* were wont to call them clowns that eat flesh: and since *Plato* to evidence the temperance of the noble *Greeks* before *Troy*, observed, that it was not found they fed on fish, though they lay so long near the *Hellespont*; *Odys.* 4<sup>o</sup>. and was only observed in the companions of *Menelaus*, that being almost starved, betook themselves to fishing about *Pharos*.

Nor will (I fear) the attest or prescript of Philosophers and Physitians, be a sufficient ground to confirm or warrant common practice, as is deducible from ancient Writers, from *Hippocrates*, *Galen*, *Simeon*, *Sethi*: and the later tracts of *Nonnus Non* de re cibaria. and *Castellanus*. *Cast.* de esu carniū. So *Aristotle* and *Albertus* commend the flesh of young Hawks: *Galen* *Gal.* Alim. fac. lib. 3. when they feed on Grapes: but condemneth Quails, and ranketh Geese but with Ostriches; which notwithstanding, present practice and every table extolleth. Men think they have fared hardly, if in times of extremity they have descended so low as Dogs: but *Galen* delivereth *Gal.* Simpl. fac. lib. 3. were the food of many Nations: and *Hippocrates* *Hip.* de morbis de superfit. ranketh the flesh of Whelps with that of Birds: who also commends them against the Spleen, and to promote conception. The opinion in *Galens* time, which *Pliny* also followeth, deeply condemned Horse-flesh, and conceived the very blood thereof destructive; but no diet is more common among the *Tartars*, who also drink their blood. And though this may only seem an adventure of *Northern* stomachs, yet as *Herodotus* tells us, in the hotter clime of *Persia*, the same was a convivial dish, and solemnly eaten at the feasts of their nativities: whereat they dressed whole Horses, Camels and Asses; contemning the Poverty of *Grecian* feasts, as unfurnish'd of dishes sufficient to fill the bellies of their guests.

Again, While we confine our diet in several places, all things almost are eaten, if we take in the whole earth: for that which is refused in one country, is accepted in another, and in the collective judgment of the world, particular distinctions are overthrown. Thus were it not hard to shew, that Tigers, Elephants, Camels, Mice, Bats and others, are the food of several countries; and *Lerius* with others delivers, that some *Americans* eat of all kinds, not refraining Toads and Serpents: and some have run so high, as not to spare the flesh of man: a practise inexcusable, nor to be drawn into example, a diet beyond the rule and largest indulgence of God.

As for the objection against beasts and birds of prey, it acquitteth not our practice, who observe not this distinction in fishes: nor regard the same in our diet of Pikes, Perches and Eels; Nor are we excused herein, if we examine the stomachs of Mackerels, Cods, and Whittings. Nor is the foulness of food sufficient to justifie our choice; for (beside that their natural heat is able to convert the same

into laudable aliment) we refuse not many whose diet is more impure then some which we reject; as may be considered in hogs, ducks, puets, and many more.

Thus we perceive the practice of diet doth hold no certain course, nor solid rule of selection or confinement; Some in an indistinct voracity eating almost any, others out of a timorous pre-opinion, refraining very many. Wherein indeed necessity, reason and Physick, are the best determinators. Surely many animals may be fed on, like many plants; though not in alimental, yet medical considerations: Whereas having raised Antipathies by prejudgement or education, we often nauseate proper meats, and abhor that diet which disease or temper requireth.

A problem.

Now whether it were not best to conform unto the simple diet of our fore-fathers; whether pure and simple waters were not more healthfull then fermented liquors; whether there be not an ample sufficiency without all flesh, in the food of honey, oyl, and the several parts of milk: in the variety of grains, pulses, and all sorts of fruits; since either bread or beverage may be made almost of all? whether nations have rightly confined unto several meats? or whether the common food of one countrey be not more agreeable unto another? how indistinctly all tempers apply unto the same, and how the diet of youth and old age is confounded: were considerations much concerning health, and might prolong our days, but must not this discourse.

## CHAPTER XXVI Of Sperma-Ceti, and the Sperma-Ceti Whale

What Sperma-Ceti is, men might justly doubt, since the learned *Hofmannus* in his work of Thirty years *De medicamentis officin.*, saith plainly, *Nescio quid sit*. And therefore need not wonder at the variety of opinions; while some conceived it to be *flos maris*, and many, a bituminous substance floating upon the sea.

That it was not the spawn of the Whale, according to vulgar conceit, or nominal appellation Phylosophers have always doubted, not easily conceiving the Seminal humour of Animals, should be inflamable; or of a floating nature.

That it proceedeth from a Whale, beside the relation of *Clusius* and other learned observers, was indubitably determined, not many years since by a Sperma-Ceti Whale, *Near Wells*. cast on our coast of *Norfolk*. Which, to lead on further inquiry, we cannot omit to inform. It contained no less then sixty foot in length, the head somewhat peculiar, with a large prominency over the mouth; teeth only in the lower Jaw, received into fleshly sockets in the upper. The Weight of the largest about two pound: No gristly substances in the mouth, commonly called Whale-bones; Only two short finns seated forwardly on the back; the eyes but small, the pizell large, and prominent. *Near Hunstanton*. A lesser Whale of this kind above twenty years ago, was cast upon the same shore.

The discription of this Whale seems omitted by *Gesner*, *Rondeletius*, and the first Editions of *Aldrovandus*; but describeth the latin impression of *Pareus*, in the Exoticks of *Clusius*, and the natural history of *Nirembergius*; but more amply in Icons and figures of *Johnstonus*.

Mariners (who are not the best Nomenclators) called it a *Jubartas*, or rather *Gibbartas*. Of the same appellation we meet with one in *Rondeletius*, called by the *French* Gibbar, from its round and Gibbous back. The name *Gibbarta* we find also given unto one kind of *Greenland* Whales: But this of ours seemed not to answer the Whale of that denomination; but was more agreeable unto the *Trumpa* or Sperma-Ceti Whale: according to the account of our *Greenland* describers in *Purchas*. And maketh the third among the eight remarkable Whales of that Coast.

Out of the head of this Whale, having been dead divers days, and under putrifaction, flowed streams of oyl and Sperma-Ceti; which was carefully taken up and preserved by the Coasters. But upon breaking up, the Magazin of Sperma-Ceti, was found in the head lying in folds and courses, in the bigness of goose eggs, encompassed with large flakie substances, as large as a mans head, in form of hony-combs, very white and full of oyl.

Some resemblance or trace hereof there seems to be in the *Physiter* or *Capidolio* of *Rondeletius*; while he delivers, that a fatness more liquid then oyl, runs from the brain of that animal; which being out, the Reliques are like the scales of *Sardinos* pressed into a mass; which melting with heat, are again concreted by cold. And this many conceive to have been the fish which swallowed *Jonas*. Although for the largeness of the mouth, and frequency in those seas, it may possibly be the *Lamia*.

Some part of the Sperma-Ceti found on the shore was pure, and needed little depuration; a great part mixed with fetid oyl, needing good preparation, and frequent expression, to bring it to a flakie consistency. And not only the head, but other parts contained it. For the carnous parts being roasted, the oyl dropped out, an axungious and thicker parts subsiding; the oyl it self contained also much in it, and still after many years some is obtained from it.

*Greenland* Enquirers seldom meet with a Whale of this kind: and therefore it is but a contingent Commodity, not reparable from any other. It flameth white and candent like Camphire, but dissolveth not in *aqua fortis*, like it. Some lumps containing about two ounces, kept ever since in water, afford a fresh and flosculous smell. Well prepared and separated from the oyl, it is of a substance unlikely to decay, and may out last the oyl required in the Composition of *Mathiolus*.

Of the large quantity of oyl, what first came forth by expression from the Sperma-Ceti, grew very white and clear, like that of Almonds or Ben. What came by decoction was red. It was found to spend much in the vessels which contained it: It freezeth or coagulateth quickly with cold, and the newer soonest. It seems different from the oyl of any other animal, and very much frustrated the expectation of our soap-boylers, as not incorporating or mingling with their lyes. But it mixeth well with painting Colours, though hardly drieth at all. Combers of wooll made use hereof, and Country people for cuts, aches and hard tumors. It may prove of good Medical use; and serve for a ground in compounded oyls and Balsams. Distilled, it affords a strong oyl, with a quick and piercing water. Upon Evaporation it gives a balsame, which is better performed with Turpentine distilled with Sperma-Ceti.

Had the abominable scent permitted, enquiry had been made into that strange composure of the head, and hillock of flesh about it. Since the Work-men affirmed, they met with *Sperma-Ceti* before they came to the bone, and the head yet preserved, seems to confirm the same. The Sphincters inserving unto the Fistula or spout, might have been examined, since they are so notably contrived in other cetaceous Animals; as also the Larynx or Throtle, whether answerable unto that of Dolphins and Porposes in the strange composure and figure which it maketh. What figure the stomach maintained in this Animal of one jaw of teeth, since in Porposes, which abound in both, the ventricle is trebly divided, and since in that formerly taken nothing was found but Weeds and a Loligo. The heart, lungs, and kidneys had not escaped; wherein are remarkable differences from Animals of the land, likewise what humor the bladder contained, but especially the seminal parts, which might have determined the difference of that humour; from this which beareth its name.

In vain it was to rake for Ambergreece in the panch of this *Leviathan*, as *Greenland* discoverers, and attests of experience dictate, that they sometimes swallow great lumps thereof in the Sea; insufferable fetour denying that enquiry. And yet if, as *Paracelsus* encourageth, Ordure makes the best Musk, and from the most fetid substances may be drawn the most odoriferous Essences; all that had not *Vespasians* Nose Cui dulcis odor lucri ex re qualibet., might boldly swear, here was a subject fit for such extractions.

## CHAPTER XXVII

Compendiously of sundry Tenents concerning other Animals, which examined, prove either false or dubious.

1. And first from great Antiquity, and before the Melody of *Syrens*, the Musical note of Swans hath been commended, and that they sing most sweetly before their death. For thus we read in *Plato*, that from the opinion of *Metempsychosis*, or transmigration of the souls of men into the bodies of beasts most sutable unto their humane condition, after his death, *Orpheus* the Musician became a Swan. Thus was it the bird of *Apollo* the god of Musick by the *Greeks*; and an Hieroglyphick of musick among the *Egyptians*, from whom the *Greeks* derived the conception; hath been the affirmation of many Latines, and hath not wanted assertors almost from every Nation.

Of swans, and their singing before death.

All which notwithstanding, we find this relation doubtfully received by *Ælian*, as an hear-say account by *Bellonius*, as a false one by *Pliny*, expresly refuted by *Myndius* in *Athenæus*; and severely rejected by *Scaliger*; whose words unto *Cardan* are these: *De Cygni vero cantu suavissimo quem cum parente mendaciorum Græcia jactare ausus est, ad Luciani tribunal, apud quem novi aliquid dicas, statuo.* Authors also that countenance it, speak not satisfactorily of it. Some affirming they sing not till they die; some that they sing, yet die not. Some speak generally, as though this note were in all; some but particularly, as though it were only in some; some in places remote, and where we can have no trial of it; others in places where every experience can refute it; as *Aldrovandus* upon relation delivered, concerning the Musick of the Swans on the river of *Thames* near *London*.

The figuration to be found in Elks, and not in common Swans.

Now that which countenanceth, and probably confirmeth this opinion, is the strange and unusual conformation of the wind pipe, or vocal organ in this animal; observed first by *Aldrovandus*, and conceived by some contrived for this intention. For in its length it far exceedeth the gullet; and hath in the chest a sinuous revolution, that is, when it ariseth from the lungs, it ascendeth not directly unto the throat, but descending first into a capsulary reception of the breast bone; by a Serpentine and Trumpet recurvation it ascendeth again into the neck; and so by the length thereof a great quantity of air is received, and by the figure thereof a Musical modulation effected. But to speak indifferently, this formation of the Weazon, is not peculiar unto the Swan, but common also unto the Platea or Shovelard, a bird of no Musical throat; And as *Aldrovandus* confesseth, may thus be contrived in the Swan to contain a larger stock of air, whereby being to feed on weeds at the bottom, they might the longer space detain their heads under water. But were this formation peculiar, or had they unto this effect an advantage from this part: yet have they a known and open disadvantage from another; that is, a flat bill. For no Latirostrous animal (whereof nevertheless there are no slender numbers) were ever commended for there note, or accounted among those animals which have been instructed to speak.

When therefore we consider the dissention of Authors, the falsity of relations, the indisposition of the Organs, and the immusical note of all we ever beheld or heard of; if generally taken and comprehending all Swans, or of all places, we cannot assent thereto. Surely he that is bit with a Tarantula, shall never be cured by this Musick; and with the same hopes we expect to hear the harmony of the Spheres.

Of the Peacock.

2. That there is a special propriety in the flesh of Peacocks, roast or boiled, to preserve a long time incorrupted, hath been the assertion of many; stands yet confirmed by *Austin*, *De Civitate Dei*; by *Gygas Sempronius*, in *Aldrovandus*; and the same experiment we can confirm our selves, in the brawn

or fleshly parts of Peacocks so hanged up with thred, that they touch no place whereby to contract a moisture; and hereof we have made trial both in summer and winter. The reason, some, I perceive, attempt to make out from the siccity and driness of its flesh, and some are content to rest in a secret propriety thereof. As for the siccity of the flesh, it is more remarkable in other animals, as Eagles, Hawks, and birds of prey; That it is a propriety or agreeable unto none other, we cannot with reason admit: for the same preservation, or rather incorruption we have observed in the flesh of Turkeys, Capons, Hares, Partridge, Venison, suspended freely in the air, and after a year and a half, dogs have not refused to eat them.

As for the other conceit, that a Peacok is ashamed when he looks on his legs, as is commonly held, and also delivered by *Cardan*; beside what hath been said against it by *Scaliger*; let them believe that hold specificial deformities; or that any part can seem unhandsome to their eyes, which hath appeared good and beautiful unto their makers. The occasion of this conceit, might first arise from a common observation, that when they are in their pride, that is, advance their train, if they decline their neck to the ground, they presently demit, and let fall the same: which indeed they cannot otherwise do; for contracting their body, and being forced to draw in their foreparts to establish the hinder in the elevation of the train; if the foreparts depart and incline to the ground, the hinder grow too weak, and suffer the train to fall. And the same in some degree is also observable in Turkeys.

#### Of the Stork.

3. That Storcks are to be found, and will only live in Republikes or free States, is a petty conceit to advance the opinion of popular policies, and from Antipathies in nature, to disparage Monarchical government. But how far agreeable unto truth, let them consider who read in *Pliny*, that among the *Thessalians* who were governed by Kings, and much abounded with Serpents, it was no less then capital to kill a Stork. That the Ancient *Egyptians* honoured them, whose government was from all times Monarchical. That *Bellonius* affirmeth, men make them nests in *France*. That relations make them common in *Persia*, and the dominions of the great *Turk*. And lastly, how *Jeremy* the Prophet delivered himself Jer. 8. 7. unto his countrey men, whose government was at that time Monarchical. The Stork in the heaven knowing her appointed time, the Turtle, Crane and Swallow observe the time of their coming, but my people know not the judgment of the Lord. Wherein to exprobate their stupidity, he induceth the providence of Storcks. Now if the bird had been unknown, the illustration had been obscure, and the exprobatation not so proper.

#### Of the Bittor.

4. That a Bittor maketh that mugient noise, or as we term it Bumping, by putting its bill into a reed as most believe, or as *Bellonius* and *Aldrovandus* conceive, by putting the same in water or mud, and after a while retaining the air by suddenly excluding it again, is not so easily made out. For my own part, though after diligent enquiry, I could never behold them in this motion; Notwithstanding by others whose observations we have expressly requested, we are informed, that some have beheld them making this noise on the shore, their bills being far enough removed from reed or water; that is, first strongly attracting the air, and unto a manifest distention of the neck, and presently after with great contention and violence excluding the same again. As for what others affirm of putting their bill in water or mud, it is also hard to make out. For what may be observed from any that walketh the Fens, there is little intermission, nor any observable pawse, between the drawing in and sending forth of their breath. And the expiration or breathing forth doth not only produce a noise, but the inspiration or hailing in of the air, affordeth a sound that may be heard almost a flight-shot.

Now the reason of this strange and peculiar noise, is deduced from the conformation of the wind-pipe, which in this bird is different from other volatiles. For at the upper extream it hath no fit Larinx, or throttle to qualify the sound, and at the other end, by two branches deriveth it self into the lungs. Which division consisteth only of Semicircular fibers, and such as attain but half way round the part; By which formation they are dilatible into larger capacities, and are able to contain a

fuller proportion of air; which being with violence sent up the weazon, and finding no resistance by the Larinx, it issueth forth in a sound like that from caverns, and such as sometimes subterraneous eruptions, from hollow rocks afford. As *Aristotle* observeth in a Problem *Sect. 15.*, and is observable in pitchers, bottles, and that instrument which *Aponensis* upon that Problem describeth, wherewith in *Aristoteles* time Gardiners affrighted birds.

Whether the large perforations of the extremities of the weazon, in the *abdomen*, admitting large quantity of ayr within the cavity of its membrans, as it doth in Frogs; may not much assist this mugiency or boation, may also be considered. For such as have beheld them making this noise out of the water, observe a large distention in their bodies; and their ordinary note is but like that of a Raven.

#### Of Whelps.

5. That whelps are blind nine days and then begin to see, is the common opinion of all, and some will be apt enough to descend unto oaths upon it. But this I find not answerable unto experience, for upon a strict observation of many, I have scarce found any that see the ninth day, few before the twelfth, and the eyes of some not open before the fourteenth day. And this is agreeable unto the determination of *Aristotle*: who computeth the time of their anopsie or non-vision by that of their gestation. For some, saith he, do go with their young the sixt part of a year, two days over or under, that is, about sixty days or nine weeks; and the whelps of these see not till twelve days. Some go the fifth part of a year, that is, seventy-one days, and these, saith he, see not before the fourteenth day. Others do go the fourth part of the year, that is, three whole months, and these, saith he, are without sight no less then seventeen days. Wherein although the accounts be different, yet doth the least thereof exceed the term of nine days, which is so generally received. And this compute of *Aristotle* doth generally overthrow the common cause alleadged for this effect, that is, a precipitation or over-hasty exclusion before the birth be perfect, according unto the vulgar Adage, *Festinans canis caecos parit catulos*: for herein the whelps of longest gestation, are also the latest in vision. The manner hereof is this. At the first littering, their eyes are fastly closed, that is, by coalition or joining together of the eyelids, and so continue untill about the twelfth day; at which time they begin to separate, and may be easily divelled or parted asunder; they open at the inward Canthis or greater Angle of the eye, and so by degrees dilate themselves quite open. An effect very strange, and the cause of much obscurity, wherein as yet mens enquiries are blind, and satisfaction not easily acquirable. What ever it be, thus much may we observe, those animals are only excluded without sight, which are multiparous and multifidous, that is, which have many at a litter, and have also their feet divided into many portions. For the Swine, although multiparous, yet being bisulcous, and only cloven hoofed, is not excluded in this manner, but farrowed with open eyes, as other bisulcous animals.

#### Of a Toad and a Spider.

6. The Antipathy between a Toad and a Spider, and that they poisonously destroy each other, is very famous, and solemn stories have been written of their combats; wherein most commonly the victory is given unto the Spider. Of what Toads and Spiders it is to be understood would be considered. For the Phalangium and deadly Spiders, are different from those we generally behold in *England*. However the verity hereof, as also of many others, we cannot but desire; for hereby we might be surely provided of proper Antidotes in cases which require them; But what we have observed herein, we cannot in reason conceal; who having in a Glass included a Toad with several Spiders, we beheld the Spiders without resistance to sit upon his head and pass over all his body; which at last upon advantage he swallowed down, and that in few hours, unto the number of seven. And in the like manner will Toads also serve Bees, and are accounted enemies unto their Hives.

#### Of a Lion and a Cock.

7. Whether a Lion be also afraid of a Cock, as is related by many, and believed by most, were very easie in some places to make trial. Although how far they stand in fear of that animal, we may

sufficiently understand, from what is delivered by *Camerarius*, whose words in his *Symbola* are these: *Nostris temporibus in Aula serenissimi Principis Bavariae, unus ex Leonibus miris saltibus in vicinam cujusdam domus aream sese dimisit, ubi Gallinaceorum cantum aut clamores nihil reformidans, ipsos unà cum plurimis gallinis devoravit.* That is, In our time in the Court of the Prince of *Bavaria*, one of the Lions leaped down into a Neighbours yard, where nothing regarding the crowing or noise of the Cocks, he eat them up with many other Hens. And therefore a very unsafe defensative it is against the fury of this animal (and surely no better then Virginity or bloud Royal) which *Pliny*

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